




3 1761 11730520 1



Digitized by the Internet Archive
in 2023 with funding from
University of Toronto

<https://archive.org/details/31761117305201>

Doc
nt
n

Gov. Doc.
Ont.
4

*Ontario University Finance, Royal
Commission on*

Government
Publications

REPORT
[and Appendix]
OF

ROYAL COMMISSION

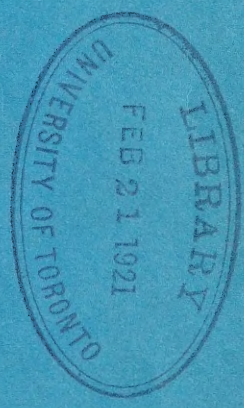
ON

UNIVERSITY FINANCES

VOL. I. — II

(Sessional paper, No. 65, 1921)

PRINTED BY ORDER OF
THE LEGISLATIVE ASSEMBLY OF ONTARIO



TORONTO:

Printed by CLARKSON W. JAMES, Printer to the King's Most Excellent Majesty
1921

Gov. Doc.
Ont
4

Ontario University Finances, Royal
Commission on
CAZON
21
20301

REPORT
[and Appendix]
OF

ROYAL COMMISSION

Government
Publications

ON

UNIVERSITY FINANCES

Vol. 1 - 2

Sessional paper, No. 65, 1921.

PRINTED BY ORDER OF
THE LEGISLATIVE ASSEMBLY OF ONTARIO



TORONTO:

Printed by CLARKSON W. JAMES, Printer to the King's Most Excellent Majesty

1921

Printed by
THE RYERSON PRESS.

Report of Royal Commission on University Finances

TO HIS HONOUR THE LIEUTENANT-GOVERNOR:

The Commissioners appointed by Your Honour to inquire into and report upon certain financial matters relating to the Provincial University; Queen's University, Kingston, and Western University, London, have completed their labours, and respectfully beg to report to Your Honour the results of their inquiries and such recommendations in regard to financial aid as they deem to be warranted, together with certain other recommendations which they consider advisable.

The terms of the Royal Commission dated the 27th day of October, 1920, authorized and empowered your Commissioners "(a) to inquire into and report upon a basis for determining the financial obligations of the Province toward the University of Toronto, and the financial aid which the Province may give to Queen's University of Kingston and the Western University of London; (b) to recommend such permanent plan of public aid to the said Universities as shall bear a just and reasonable relation to the amount of the legislative grants to primary and secondary education, and (c) to make such suggestions on any of the above subjects as may seem, in the opinion of the Commission, to be desirable."

COURSE OF THE INQUIRY.

In order that the inquiry might be as careful and comprehensive as possible, it was decided to request the representatives of the Provincial University and of Queen's and Western Universities to appear before your Commissioners on certain dates, and to present full information on their financial resources and needs, on their academic work, on the number of their student body, and on any matters of general University policy on which it might be deemed desirable to consult them. Your Commissioners decided to visit each of the three Universities and to make themselves personally familiar with buildings, equipment, staff, actual conditions of work, and location of proposed new buildings. Advertisements also were inserted in the local papers of each city inviting communications from educational, industrial, scientific or other public bodies, which might desire to make representations to the Commission in regard to University matters.

We visited the Western University on November 18th, the University of Toronto on November 19th, and Queen's University on November 22nd, 1920. Representatives of the Universities and of various organizations connected with them appeared before us on the following dates:

University of Toronto, December 6th, 1920.

Western University, December 8th, 1920.

Queen's University, December 13th, 1920.

We desire to hear testimony to the zeal and efficiency of the members of the staffs of the various Universities whom we interviewed on our tour of investigation. We found them loyal to their institution, eager to make their faculty and department the foremost in the University, competent in scholarship, and in touch with the

most recent advances made elsewhere in their special fields of learning. We received the fullest information from the authorities of the three Universities. We have received important statements from the Royal Canadian Institute, the United Farmers of Ontario, the Workmen's Educational Association, the Alumni and Alumnae Associations of the University of Toronto, and from various individuals and deputations, who give us much information and many points of view. At the various sessions of your Commission a great deal of valuable testimony, oral and written, was presented.

VALUE OF EDUCATION.

Education is not only intimately bound up with social and industrial reconstruction, but, in a deep sense, is the most important and enduring side of post-war policy. Upon the extent to which a country develops and uses the innate abilities of its citizens, its future prosperity and permanence depend. The value of education to the nation has been realized afresh in these later days. This value is so great that it is the obligation of the State to provide full educational facilities for all its people. Only so can the healthy existence and continued progress of the State be maintained.

1. History shows the tremendous power of education over the minds and souls of men. The changes of centuries can be effected in generations, and national outlook, ideals and activities can be profoundly altered.

2. Education answers certain urgent human needs, loudly voiced in all civilized countries to-day. There is a world-wide demand for a wider distribution of wealth, for more leisure and increased interests, for more happiness in life, for more social community of spirit among all classes, for a further share in the power of management, both in industry and in government, local, national and international. The mental and moral atmosphere produced by the war has caused these needs to be more keenly felt by the great mass of the people, and has created conditions under which reforms can be effected rapidly. Education is the most valuable form of reserve wealth in meeting these requirements. It helps to secure the increased efficiency of management and labour, which increases output and makes possible shorter hours. It enables men to utilize more wisely the resources of science and to improve the organization of industry whereby a greater volume of wealth is produced for distribution. It is the best method of bringing men easily and closely together in a social community. It supplies the knowledge and the trained mind which enable men to take an effective part in helping to govern an industry, a town, or a nation.

3. In education three aspects of the human being must be duly regarded.

(a) He must be trained as an *individual*. This education contains a physical, a mental and moral area. It seeks to make the pupil *strong in body*, so that he may observe well, hear accurately, speak effectively and musically, and use skilfully his hands, the most marvellous of all tools. It seeks to give him *mental cultivation*, so that he may have a disciplined mind, a ready command of intellectual resources, a power of application and concentration, a real love of knowledge, and a genuine delight in good literature. It seeks to create ideals and to *develop character*. Right education broadens, deepens and refines human life. It makes its possessors citizens of the world; it opens the gates of the past and the windows towards the future; it widens horizons and fills lives with new interests and new pleasures.

(b) He must be trained as a *worker*. Education is needed, not only to enable the individual to live the fullest, most interesting and happiest life possible, but

also to discern what in life has to be done and what is the best way to do it. No satisfactory technical education can be given except to those who have already had or are receiving a good general education. Technical education gives the special knowledge and skill required for work. It enables a man to understand the various processes in his work; it stimulates him to use his brains and invent contrivances; it ought to make his work pleasureable and educative to himself. Education, applied to industry, commerce and the development of the natural resources of the country, promotes industrial efficiency, commercial growth and the increase of material wealth. In addition to the higher things of the mind and soul, there are material and measureable rewards of education. Among all varieties of race, and amid varying conditions of climate, natural resources, geographical location, economic and social environment, in every case it can be demonstrated that an educated people produce much and amass wealth, while an uneducated people, under the same conditions, produce little and save less. Without educated brain and skilled hands, the fertile soil, the timbered land, water-powers and mineral deposits, must lie idle or be ignorantly squandered. National wealth and industry are directly related to education and must become more and more dependent upon it as civilization advances. The education of the individual is becoming an equally important factor in individual efficiency and success in the various departments of practical life. In a land of great natural resources like our own, education is indispensable to their proper conservation and use.

(c) He must be trained *as a citizen*. Democracy makes greater demands on the intelligence of its citizens than does any other form of government. Only a well-educated democracy can prove to the world its superiority. Democracy must win the key of knowledge before it can safely wield the sceptre of power. A sound and complete education is the best preservative of democratic institutions and the best remedy against anarchic and revolutionary movements.

On all counts, the case is made good for a system of education which concerns itself with all classes in the nation. To establish and maintain such a system the State must make generous financial provision. Schools are not a charity, but a paying investment. Education is "the debt which maturity owes to youth." The wise State will seek to pay that debt with no niggard hand.

ALL GRADES OF EDUCATION INTERDEPENDENT.

Primary, Secondary and Higher Education are part of *one* great educational effort. The goal of that effort is to develop a free human being who has been prepared for the responsibility of deciding things for himself. Each division of our educational system has its share in this preparation. The same pupil may pass through all grades. The teachers of the Primary Schools are taught in the Secondary Schools by teachers who have themselves been taught in the Universities. The effectiveness of University work largely depends on the excellence of the Preparatory Schools, and the whole tone and atmosphere of the Secondary Schools are created by their University-trained staffs. The character of the work in the Primary Schools is ultimately influenced or even determined by the ideals of the University. The interests of primary, secondary and higher education are interdependent and interlocked. No one interest can be impaired without weakening the others; none can be improved without strengthening the others. To set the financial claims of one *against* the other would be to impoverish all.

THE UNIVERSITY AS THE SERVANT OF THE COMMUNITY.

The aim of a University is not to develop a self-centred culture, but to use culture, knowledge and discipline in the service of the community.

1. Universities are the natural centres and culminating points of the educational system of a country. Their influence is felt through every part of the system, and even beyond it, in the continued and voluntary education of adults.

2. Their primary function is to provide a liberal education. A University which trains only narrow specialists is in danger of losing sight of one of its highest functions. The production of the specialist is secured at too high a cost if it is gained by sacrificing breadth of outlook and zest and range of intellectual curiosity about all things that contribute to the knowledge or enrich the life of man. A certain width of view is essential to the reality of academic culture. The mission of the University is to represent the organized will and power of the community in promoting all that makes for intellectual advancement and moral elevation.

3. Universities train men for leadership in every sphere of work. In a period of world-wide reconstruction, leaders must possess clearness of thought and adequate knowledge. This the University may be expected to supply. The University-trained man ought to contribute to his country, as a citizen: (a) the *spirit of progress*, which hopes, because it is always seeking to better conditions by knowledge and skill; (b) the *spirit of moderation*, which is cautious, because it resists the vehemence of one-sidedness and the impulse to grasp at hasty expedients; (c) the *love of truth*, which realizes the worth of thorough and systematized knowledge, which keeps an open mind to new ideas, and which holds preconceptions in due control. Men possessed of this true academic spirit can help to form a sound public opinion and can furnish skilled leaders in commercial, industrial, social, political and religious movements.

4. Universities train the teachers in the Secondary Schools and in many of the larger Primary Schools. Through this group of graduates the University reaches the whole educational system. The quality of instruction and the mental stimulus given by the Secondary School teachers largely determine the intellectual interest, the public spirit, the literary tastes and the moral tone of each generation as it passes from adolescence to manhood. The quality of these teachers and their power to inspire fine ideals in youthful minds depend in turn on the spirit which their University has breathed into them, and on the high conception it has given them, of what intellectual energy and enjoyment really mean.

5. Universities are the visible evidence of the homage which the State pays to learning and science; the symbol of how much there is in life beyond material development and commercial success. They should be the homes of great ideals; the nursing-mothers of great characters. They seek to extend the realm of knowledge apart from any utilitarian value, confident that all knowledge increases the power of man. They teach those who are entering on life to think of the past and the future, as well as of the present, and to make the achievements of the past a challenge to the improvement of the future.

6. Universities provide the highest training in the application of knowledge to all departments of life. From the national point of view, this aspect of University work is of great practical value. We need the trained scientist to discover the full extent of our natural resources and to improve and develop our methods of industry. We need skill, vision and informed organizing ability to turn our agricultural and commercial possibilities into realities. We need the clearest

reasoning and most effective action of our best-trained citizens to deal with our economic problems, social difficulties and political tasks. Universities should focus whatever information science can provide for any form of service to the State. They should place their knowledge of economic history and of economic experiments in all countries at the disposal of administrative officials and Legislatures. From the trained staff of a University should be furnished investigators in the scientific, economic or historical fields, whose extent of knowledge and mastery of method would make them helpful colleagues of practical men charged with making such inquiries.

7. Universities should seek out and develop unusual human talent, in whatever walk of life it may be found, and make it available for the service of the State.

The University, in fine, is one of the chief organs of the higher life of the State. Its facilities should be brought within reach of the greatest possible number of the people.

THE PRESENT UNIVERSITY SITUATION IN THE PROVINCE.

1. The existing situation is partly the legacy of past controversies and partly the result of present demands. The story of University development in the Province is long and varied.

(a) There was at first a State-established denominational University, the religious restrictions connected with which led to the founding of other denominational institutions.

(b) For some years the State University, freed from denominational control, co-existed with independent denominational Universities.

(c) Then Victoria University, and later Trinity University, federated with the Provincial University.

(d) The present situation is that a Federated State University exists, and outside it are two independent, undenominational Universities, Queen's and Western, and two independent denominational Universities, McMaster and Ottawa.

2. The University of Toronto is the creation of the Province. It is controlled on its business and administrative side by a Board of Governors, all of whom are appointed by the Government, and all of whom are removable by the Government at the expiration of their terms of office. They represent the Government, which in turn represents the Province. Its financial support comes in largest measure from the Province. Its sources of income are: (a) an endowment which yields over \$60,000 a year, originally granted by the State; (b) the fees of students, purposely kept as low as possible, amounting in 1919-20 to \$382,000; (c) income from dining hall and residences, amounting in 1919-20 to \$56,860; and (d) the Government grant, which is partly statutory (amounting to \$500,000) and partly voted annually, to cover the expenditure beyond the yearly statutory grant.

The buildings of the Provincial University have been erected partly from the original endowment, partly out of income, partly from special legislative grant, and partly from private benefactions (such as the Household Science Building, the Connaught Laboratories and Hart House).

3. Queen's and Western Universities have for some years received annual grants from the Government on account of the School of Mining at Kingston and the Institute of Public Health at London. More recently they have applied year by year for special grants to aid their Arts, Science and Medical Faculties. These grants have been given, but on no settled basis or policy.

(i) The income of Queen's University is derived from (a) students' fees, about \$145,000; (b) endowment of \$1,791,495, yielding in 1920-21 about \$97,000, and (c) Provincial grants, in 1920-21, \$165,000. The buildings of Queen's have been erected partly by private or local benefaction, and partly by grants from the Provincial Government.

(ii) The income of the Western University is derived from: (a) students' fees, in 1920-21, \$26,000; (b) grant from the City of London, \$55,000, and (c) Government grant, \$84,000. There is no general endowment at present, but there are definite prospects of securing such a fund in the near future. The new Medical Building has been erected from local sources at a cost of \$450,000. The Public Health Institute—an integral part of the University—was erected at a cost of \$60,000 by the Province. The other work of the University is carried on mainly in rented or donated premises.

SUMMARY OF RECOMMENDATIONS.

We summarize our principal recommendations:

1. That for the maintenance of the Provincial University and of University College there be restored the basis of support in the Act of 1906, viz., a yearly sum equal to 50% of the average of the succession duties for the three preceding years, the percentage to be subject to such conditions as are set forth in the Section of the Report dealing with this subject.

2. That annual maintenance grants be paid to Queen's and Western Universities out of Consolidated Revenue, and that these grants be readjusted every five years by a Court of Reference to be appointed by the Lieutenant-Governor in Council.

3. That grants on Capital Account for buildings urgently needed be given to the Provincial University (\$1,500,000); to Queen's (\$340,000); to Western (\$800,000).

4. That if increased revenues for education be required in future, the Government consider the advisability of levying a direct tax of one mill on the dollar on the municipally-assessed value of the rateable property of the Province (excluding incomes), ear-marked for general educational purposes.

5. That in any University aided by State funds no new faculty be established and no new building (paid for by public funds) be erected without the consent of the Lieutenant-Governor in Council.

6. That a University Day be provided for in the Legislature, on which the Heads of the various Universities shall appear to report on their work.

7. That a Department of Graduate Studies and Research be organized in the Provincial University as soon as practicable.

8. That if the future increase of candidates seeking admission to the Universities should be so great as to make still further increase of staff and buildings necessary, the Department of Education and the Universities of the Province be asked to consider the transfer of the present First-Year University work to the Collegiate Institutes and High Schools.

9. That University College be given its historic academic building, and that the Administrative Offices be transferred to a new building.

10. That certain necessary additions be made to the buildings of the Ontario College of Education.

11. That certain extensions be made to the Royal Ontario Museum.

12. That the Provincial University continue to be controlled by a Board of Governors, and that such Board be truly representative of the whole Province.

ADEQUATE SUPPORT OF THE PROVINCIAL UNIVERSITY.

We believe that a united public opinion will be created in support of Higher Education in the Province by two broad lines in policy:

(a) Adequate support for the Provincial University, for which the State is primarily and solely responsible.

(b) Such reasonable support to the other two Universities as will be just to them and to the districts of the Province which they specially serve, and will extend the benefits of Higher Education to a wider circle of students.

It is a primary obligation upon the Province to make the Provincial University worthy of the intelligence, wealth and resources of the Province. Nothing but a University of first rank should be the crown of our educational effort.

1. The Provincial University stands in a unique relation to the State. It was established by public funds; it has been maintained by public funds. It is controlled by a Board appointed by the Government. It has for generations been recognized by custom and by legal enactment as the special property of the State. No change in its formal status has been suggested or recommended. Its unique position is acknowledged by all. The State has legal and moral obligations to it. The terms of our Commission recognize "the financial obligations of the Province toward the University of Toronto."

2. The Federation Act of 1887 and the University Act of 1906, which fully recognized the fact of Federation, really make a *contract* between the State and the Federated Universities. The Province obligated itself to provide ample facilities and financial support for the State University, in which the Federated Universities would fully participate. Federation was a compact, according to which the Province undertook to maintain the Provincial University in a state of high efficiency. One of the chief arguments used in the interests of federation was that, through the disappearance of distracting counter ecclesiastical interests, the Legislature of the Province would be free to make generous grants to the Federated Provincial University. The compact still stands. The contract remains.

3. The University has grown to be one of the largest and best on this continent and in the British Empire. Its degrees are recognized as representing excellence of standard and thoroughness of training. For the money granted to it, it has given a good return in scholarship, culture, scientific achievement and public service.

4. Its present work and needs fairly justify full measure of financial support. It is a popular delusion that the University is an independently rich and prosperous corporation. Practically all it has the State has given or is giving. That the State is not giving an inordinate amount is seen by a comparison (made elsewhere in this Report) of the money granted by American States of similar population and resources to their State Universities, with the annual grants made by this Province to its Provincial University.

(a) The *pressure of numbers* has steadily increased. The total registration to-day is over 4,600 in all faculties. The attendance in Arts is larger than ever. The registration in Arts and Applied Science will probably be maintained; that in Medicine will in due time be slightly reduced; there will assuredly be a great increase in the new Department of Commerce, and in post-graduate work. This

registration is practically in the great central University Faculties of Arts, Applied Science and Medicine. Dentistry and Law are not included, as they are in many American institutions, nor are the students in correspondence and summer courses counted in. We describe elsewhere a method of checking increase of numbers by raising standards; but even if this proposal be carried into effect, the problem of increasing numbers will remain. It is the inevitable problem arising in a country where there is a keen desire for the best in education, and where the possibilities of developing natural resources are fully recognized. This natural growth of the student body creates its own demand for increased financial expenditure.

(b) The increase in numbers has called for an *increase in staff*. Efficient teaching cannot be given when classes are so large as to destroy personal contact between professor and student. The staff of the University has never been large enough to free those of its members who have the aptitude for original investigation, from elementary teaching and routine work.

(c) We have dealt later with readjustment of salaries by the University authorities, necessitated by increase of staff and cost of living.

(d) *Faculties have been enlarged and new faculties have been established:* (i) The Faculty of Applied Science comes into close relation with the various material developments of the country. Engineering—a practical scientific education—is more than ever applicable to general business and commercial pursuits. The swing at present is towards Chemical and Electrical Engineering. This Faculty teaches both theory and practice in College, and during vacation uses the great outside world of mining or industry as the real laboratory. We have only begun to realize the value of the services which such a Faculty can render in developing the natural resources of our country. (ii) The Faculty of Medicine is well-staffed on the side of the scientific preliminary studies. The Eaton gift and the Rockefeller gift make possible developments in the Clinical departments. The health of the Province is of such vital moment that wise expenditure on the thorough training of members of the medical profession is amply justified. (iii) The Faculty of Forestry plays a great part in the material progress of the Province. The forests have yielded larger revenues than the mines to the Provincial Treasury. Scientific care of our forest resources will assure a permanent productivity. The University Faculty deals with a wider and different field than is covered in the Ontario Agricultural College at Guelph. Both the basic sciences and the practical experience of the forests are required to produce the type of forester whose life-work it will be to conserve and develop the forest resources of Canada. (iv) The new Department of Commerce will cover a range of subjects not heretofore generally included in a University curriculum, and will train students to deal with the problems of actual business and finance. (v) While we have due regard to these demands of applied science and professional training, we do not forget the indispensable basis of liberal arts and pure science. The “humanities,” the “liberal studies,” represented by the College subjects and the non-laboratory University subjects, must not be overwhelmed or thrust aside. They should be maintained in their central and fundamental position. The “human” is the basis of the “professional.”

(e) *New buildings* are required. Without these, important departments of the University will be seriously crippled. We have indicated elsewhere which of these are, in our judgment, of most immediate urgency. For University College and the non-laboratory University subjects, building additions should be made as soon as possible. The conditions of overcrowding, inconvenience, bad light and poor ventilation found in many of the improvised lecture rooms call for prompt

and drastic remedy. Administration, Forestry and Anatomy require new housing and proper facilities. To maintain the health of the women students, a matter of supreme importance, a suitable gymnasium should be provided. The income from the Rockefeller gift is conditioned on the erection of the new Anatomy building. Other buildings will doubtless be added in due course. When the complete building programme of the University (found in detail in the Appendix to this Report) is carried out, adequate accommodation for many years will be secured.

(f) *Laboratories and Equipment* are a necessary part of the general expansion. We have found, on examination, that the existing facilities are being used most economically and up to their limit. The necessary additions should be provided both for undergraduate and graduate work.

(g) The *Library* is the laboratory of the non-scientific departments. It calls for larger annual expenditures. As post-graduate work is developed the Library will require additional space and equipment.

5. One of the most cogent reasons for adequate support of the Provincial University is the necessity of developing in it a worthy post-graduate department. This will be the distinctive line of advance in the future. The Executive Committee of the Ontario Division of the Canadian Manufacturers' Association has pertinently expressed itself on this phase of the question.

"The Association recommend that it is desirable that the Universities be maintained at a high standard of efficiency for undergraduate work; that the Provincial University should be maintained at a standard equal to the best University standards on this continent, with regard to undergraduate, post-graduate and research work; and that with respect to the higher branches of University work the resources available should be concentrated in one University."

6. The Provincial University has grown to be one of the great factors in the intellectual and material life of the people. We recommend later on a yearly statutory appropriation, which, we believe, will meet its present requirements and provide for inevitable expansion.

THE CASE FOR QUEEN'S AND WESTERN UNIVERSITIES.

In past years conflicting claims between various institutions of higher learning kept public opinion unsettled, and have to some degree hindered the formation of a substantial body of support behind the University work of the Province. The federation of Victoria and Trinity Universities with the Provincial University did much to secure public support for higher education. The making of regular grants to Queen's and Western on the basis of co-ordination of effort and avoidance of unnecessary duplication, will rally the whole Province to the aid of University training. We wish to record that the representatives of the State University have expressed cordial goodwill towards the other Universities, and that the representatives of Queen's and Western have displayed a like spirit towards the University of Toronto. Indeed, all have agreed on the necessity of building up a strong centre of well-organized post-graduate work in the State institution. The paramount question in all our conferences has been, "What is the most effective use that can be made of public money spent for higher education?"

In the future further facilities for Higher Education in the Arts Department may have to be provided in other parts of the Province. When that day comes, we believe that new Universities should not be established, but that colleges, located in convenient centres, should be linked up with existing Universities.

We recommend that definite sums for five years, to be readjusted at the end of that period, be granted to Queen's and Western for annual maintenance, and that block grants be made on Capital Account for buildings needed in the immediate future. The details of these grants are given in later sections of our Report. The grounds for our recommendations we here set out in general terms:

1. Assistance has already been given by the Province to both Universities in respect of buildings and of maintenance. War exigencies led to largely increased grants. It is most desirable, from the standpoint of the Province and of the Universities, that a definite policy be laid down. The Province would know its liability and the Universities the extent of their income.

2. The demands upon the Universities, due to increasing numbers of undergraduates and evidencing a growing desire for higher education, have come at a time of abnormal cost of living and of shrinkage in private sources of benefaction, due to heavy taxes on income and profits and to succession duties. The work of the Universities is essential to the well-being of the State. If private resources no longer suffice to support it, the State must be the benefactor.

3. All the existing University facilities in the Province are being utilized to the fullest extent to meet present requirements. None of them are idle or only partially used. If the facilities provided at Queen's and Western were not available, the State University could not meet all the demands. These, we believe, can be most economically and effectively met by using and extending the facilities of existing Universities.

4. The happy mean between centralization and decentralization can best be attained by the course we suggest. In post-graduate work, especially on its scientific side, there must be practical centralization of effort. In undergraduate work decentralization may prove a benefit. This benefit will be most marked in the Arts Faculty, which is the most cultural faculty, and indispensable to the proper mission of a University. Beyond a certain point, educational interests may be weakened by concentration. In a University the education of the student is carried on, not merely by the lecture-room and the laboratory, but also by personal intercourse with the professor and by the formation of personal friendships. In fact, a love of learning and good friendships are the best legacies a man carries away from a University. The smaller Universities have a valuable contribution to make in developing this individual factor in education. The College atmosphere or spirit is a most valuable part of the student's moral and intellectual environment, and this operates most powerfully where numbers are comparatively small. A University develops its own type and its own traditions. Queen's has a marked individuality. Western is already revealing its own peculiar genius. This diversity of University type enriches the national life.

5. We have carefully considered the possibility of wasteful duplication of teaching and equipment. This, of course, should be avoided. We have elsewhere suggested certain checks on the development of new faculties, which would tend to prevent such duplications. There would be wasteful duplication if plants stood idle or were but occasionally used; if expensive apparatus were provided in two or more centres, when all the available students could be accommodated in one place; but, as far as we have been able to determine, this kind of duplication does not, to any great extent, exist. The buildings and equipment are used to the utmost limit. The teachers are serving the needs of two or three faculties. The costs of operation are low enough to make it as economical to carry on work in these Universities as to provide additional accommodation in one central University.

6. The existence and situation of these two Universities in different parts of the Province bring the opportunities of Higher Education within the reach of thousands who would not otherwise obtain it. The great area and the diversified features of this Province suggest certain natural geographical divisions. The problems of Western Ontario—agricultural and industrial, thickly populated and centring around London—are different from those of Eastern Ontario, with its dairying and its great possibilities of power development from the St. Lawrence. Central Ontario has its own characteristics, and Northern Ontario, with its forests and mines, presents its own difficulties and opportunities. With a view to meeting the needs of these diverse districts and furnishing educational opportunity to as many as possible, the existing University centres seem to be strategically located. To a very large extent a University constituency is regional. Whether the University is rich or poor, of national reputation and influence, or almost purely local in range, the factor of local convenience is of determining importance. A study of the local sources of student attendance at our Canadian Universities and the inquiries of the General Education Board into College and University attendance in the United States, prove that the majority of the students of even the largest and most cosmopolitan Universities are drawn from within a comparatively short radius. The greater number of Harvard students come from the neighbouring country. The City of Toronto supplied 1,828 out of the 4,777 students enrolled in the University of Toronto for 1919-20, and the contiguous counties of York, Ontario and Simcoe supplied 483 more. In Western University 235 out of the 534 students registered come from the City of London. Twenty-two per cent. of the students in attendance this session at Queen's come from the City of Kingston and the County of Frontenac, and fifty-eight per cent. from Eastern Ontario. It is a fair inference from these facts that "the college must be taken to the people, if the people are going to derive the greatest benefit from the establishment of institutions of higher learning." The Legislature is warranted in aiding these Universities which serve great districts of the Province.

7. Both these Universities have done much to help themselves. Western is a young institution, but has already built its own commodious and well-equipped medical building. It receives a large yearly appropriation from the City of London. Queen's has a long and honourable history. It has raised a considerable endowment, and most of its buildings have been the gift of private liberality. Both Universities are in active operation, and can be made much more serviceable by additional financial assistance. In both Universities there is a spirit of loyalty and enthusiasm on the part of professors and students. The necessity for self-help has evoked an academic allegiance which only sacrifice for a good cause can create.

8. These Universities have the needs that are common to most institutions of higher learning to-day. They require increased salaries for the staff, increased equipment and additional buildings.

(a) Queen's is fairly well equipped with buildings. We recommend grants for the University's share of a new heating plant (which will also serve the enlarged Hospital); for a new and sorely-needed Library building, and for various additions, repairs and equipment. The whole institution is carefully and economically managed.

(b) Western has to face the heavy task of providing new buildings for its Arts Department. These are essential to its growth and efficiency. We recommend a capital grant towards the Arts Buildings. In no other way can we see a possibility of the speedy erection of buildings absolutely necessary for the work of the

University. Local financial help will still be required, and is being given on a large scale, to provide for the approaches to the new site, to put the grounds in order, and to erect dormitories and a gymnasium.

9. Queen's has made a noteworthy contribution to the life of the Province. It has provided higher education for many men of moderate means and keen intellectual ambition. It has created a student tradition of hard work, thrift and maturity. It has had an extraordinarily large share in educating the teachers of the Province. It has been marked by enthusiasm and initiative. It has always counted among its professors some of the most famous and inspiring of University teachers. Its services in the past and its good work in the present are worthy of financial aid from the Province.

10. Western is situated in the heart of one of the wealthiest and most populous agricultural and industrial parts of Ontario. Western Ontario has an estimated population of 780,000, about one-third of the population of the Province. Its municipal assessment is one-third of the whole Provincial assessment. It contains one-third of the Secondary Schools and more than one-third of the Secondary School population of the Province. It has aroused strong local enthusiasm for its support. It can supply the facilities of higher education to hundreds of students who are seeking it at a moderate cost and in the vicinity of their homes. Even under the present hampering conditions, the student body in Arts has increased at the rate of 66 $\frac{2}{3}$ % per annum for the last three years. Its Faculty of Public Health has been a pioneer, and is now carrying on valuable pathological researches. It can stimulate all the educational activities of Western Ontario by Summer Schools, by extension work, by library facilities, as well as by the direct influence it wields through its graduates and undergraduates. Its initial achievements and its wonderful opportunities justify a substantial measure of public assistance.

GOVERNMENT SUPERVISION OF UNIVERSITIES.

1. As Higher Education has in cost outgrown the power of private individuals to give it adequate support, it must appeal to the State. The State, which gives the financial support, has the right (a) to determine how this education may be most effectively and economically carried on, and (b) to exercise supervision over projected developments involving financial outlay.

2. The supervision of the expenditures of the Provincial University has been secured through a Board of Governors appointed by the Government, and through the submission of the detailed expenditures to the Legislature in the Annual Report of the President.

3. To the proposal that the Board of Governors of the University of Toronto be abolished and direct political control over the University re-established, your Commissioners have given most careful consideration; but we cannot approve it. We feel bound to agree with the views of the University Commission of 1906, which on this subject reported as follows:

"To administer the affairs of a great University with vigour and distinction, is well-nigh impossible unless the central authority is strong and devotes itself without ulterior interests and motives to the single purpose entrusted to it. The history of the Provincial University has demonstrated the disadvantage of direct political control. Despite the zealous efforts of statesmen and educationists, the University became on many occasions in times past the sport of acrimonious party disputes. Its interests were inextricably confused in the popular mind with party

politics, although with these it had, in reality, little concern. The various Ministries which at different times since 1839 have tried to reconstruct the system of administration, instead of handing over to the authorities of the University the carrying on of its affairs, reserving to the State the power of controlling and resuming the trust if conditions rendered that proceeding advisable, burdened themselves with a responsibility which, in many respects, they were unfitted to discharge . . . A proposal to delegate the powers of the Crown to a Board of Governors is dictated by the desire to impart strength, continuity and freedom of action to the supreme governing body. It is in accord with the practice of other communities possessing State Universities."

We believe, however, that this Board should be truly representative of the whole Province, and we would urge that in future appointments to it the Government should have regard to this consideration.

4. The Lieutenant-Governor in Council may, according to the Statute of Incorporation, appoint four members of the governing body of the Western University. This right has been exercised, and four members of the Board of Governors have been appointed by the Provincial Government. The Lieutenant-Governor in Council has the right to appoint four members of the Board of Trustees of Queen's University, as representing the former School of Mining, but this right has not been exercised. We do not believe that Government supervision of the expenditures made by Queen's and Western Universities can best be secured through the appointment by the Government of members of the governing bodies of these institutions. The members so appointed will, in the nature of the case, be chosen from the locality of the University, and will primarily represent the University, not the Government. Other methods can be adopted which will combine the benefits of State supervision with the freedom and enthusiasm of local management.

5. We believe that there should be a general control of the expansion of the Universities by the Government. Absolute freedom of development by each University might conflict with a well-balanced system for the whole Province.

(a) No new Faculty in any of the Universities receiving State aid should be established without the consent of the Lieutenant-Governor in Council.

(b) No new buildings, paid for by Provincial funds, should be erected without the consent of the Lieutenant-Governor in Council, and without submission of the plans to the Department of Education for its approval.

6. The audited accounts of Queen's and Western Universities should be submitted to the Provincial Department of Education.

7. It is most desirable that the fullest publicity be given to the work of the Universities in the Legislative Assembly and throughout the Province. The representatives of the people who vote the necessary financial support should be brought into close touch with the Universities in general and with the Provincial University in particular. The Provincial University is not an institution remote and aloof, but one of the greatest possessions of the Province. The more its work is known and the closer its connection with the people, the greater will be the Provincial pride in its success and the more ready and generous will be its support. We believe that this publicity and sense of public ownership can best be secured by providing a University Day in the Legislature, when, on the request of the Minister of Education, the President of the Provincial University (or some representative appointed by the Board of Governors) should attend to make report on the past year's work, to give such explanations as may be asked, and to set forth the future

policy of the University. In like manner the Minister of Education should request the Heads of Queen's and Western Universities, or their duly appointed representatives, to appear before the House and report upon the work of their institutions. By this official statement of University needs and accomplishments public opinion would be informed and consolidated in support of the whole higher educational effort of the Province.

MAINTENANCE OF UNIVERSITY STANDARDS.

When Provincial aid is given to Universities, the Government has the right to require that there be co-ordination of work, and that unprofitable duplication be avoided. There should be the same standard of entrance and graduation, however much each University may express its own genius in the development of courses. The Department of Education, by its academic requirements for Specialist teachers, requires a common standard of excellence.

RESEARCH AND GRADUATE WORK.

Consideration must be given to the provision of proper facilities for research and to the establishment of a Provincial institution for post-graduate study. This will mark a further development in Higher Education in Ontario.

1. The Great War opened the eyes of the world to the possibilities involved in scientific research. By applying the results of science to industry, agriculture and commerce, Germany grew rich and strong before the war, and the application of these results to methods of warfare had an immediate and powerful influence on its course and its issue. In the present period of reconstruction there is a demand for research in every department of science. It is felt that only by the application of scientific principles to industry and the material resources of the world, can the physical wounds of war be healed and its financial burdens borne. The Governments of various countries have felt themselves called upon to spend large sums on the organization and development of Research. It is generally recognized that industrial development rests upon investigations in pure science. If scientific principles are to be successfully applied to the solution of industrial problems, there must be a group of men thoroughly trained in these principles; and if progress is to be looked for, a group of men mainly devoted to original investigation in all branches of science. The Universities are the institutions from which a supply of such men may be expected to come.

2. The modern University has a two-fold task. (a) It must give to its students a competent knowledge of what is already known, and (b) it must seek to add something to the existing stores of knowledge, and to train men for this work of productive scholarship and original scientific investigation. The Universities are the best places in which fundamental researches may be carried on. Although the former task will remain a chief duty of the University teacher, and must not for a moment be overlooked or disparaged, he cannot, if he is to remain a living and progressive scholar, ignore the latter. Indeed, the best teacher of undergraduate work will, as a rule, be a man who has some instinct for investigation and is systematically pursuing it. Some members of the staff will find their interest and reveal their chief capacity in the work of teaching; there are others whose primary interest is research; and still others whose interest is evenly divided. It would be difficult to secure or retain on a University staff men of the highest order of ability if they were not free to repay their debt to the learning of the past by making their own

contributions to the knowledge and needs of their time. Instructional work should be so arranged that the men who have the capacity for productive work and for the direction of research, should be freer to devote themselves to it.

3. A considerable measure of research work can be carried on effectively and inexpensively among the graduates of all Universities, as far, at least, as the work for M.A. or M.Sc. While scientific research may call for elaborate apparatus and heavy expenditure, there are other forms of research which can be carried on without large capital outlay and with little equipment beyond that required for ordinary instruction. These will be determined by the strength and outstanding ability of the men in special departments and by the limitations in finance. Research is fundamentally a matter of *brains* rather than *plant*, of *men* rather than *equipment*. The greatest desideratum is outstanding *men*. Research work raises the authority of the instructor in the eyes of his students, increases his own enthusiasm and stimulates him to seek out promising students who may enter the wide field of original investigation.

4. The organization of post-graduate work on a large and systematic scale requires concentration of University resources. Graduate work and research are closely allied, although not identical. An indispensable part of a graduate student's training consists in learning how to carry on investigation. One of the most important functions of a University is to select men who show an aptitude for research and to give them the training which will fit them for successful careers in scientific achievement and for doing the highly creative work of the community. In other words, the fully-equipped University should have a worthy department of Graduate studies. Hitherto we have not had adequate facilities for post-graduate work in any of our Canadian Universities. Those who have wished to pursue this work have been obliged to leave Canada and attend Universities in other lands.

We feel that no Ontario student should be under this necessity, but that in Ontario he should be able to receive as good guidance in graduate work and research, and as advanced instruction, as can be had on this continent. To meet this urgent and growing need we believe that in the Provincial University of this Province there should be organized and developed a School of Graduate Studies. The beginnings have already been made. This post-graduate work will demand further library and laboratory equipment; but, above all, it will demand outstanding men on the professorial staff; men of inspiration, men with the instinct for original investigation, men with time free from elementary teaching. We believe that the financial provision we are recommending for the Provincial University will make possible a reasonable development in research and graduate work. We believe that if the opportunities for this advanced study are provided in our own Provincial University, many of our students from Universities in Ontario and in other Canadian Provinces will be attracted hither and retained for life service in Canada. In the past some of our ablest men have remained in the lands where they obtained their post-graduate education. Canada needs her best sons to redeem the opportunities of her golden future. The costs of a graduate department are proportionately greater than those of undergraduate departments. With our limited financial resources it would be the part of wisdom to concentrate on building up one great post-graduate University—our Provincial University—which will be worthy of Canada, and which, through the adoption by the various Ontario Universities of common standards of entrance and graduation, will make possible the co-ordination of the whole provincial effort in higher education.

5. In developing a department of research and of graduate studies we repeat

that the vital requirement is men with aptitude for original investigation. Such a department could be created by utilizing existing members of the staff possessed of the necessary qualities, by freeing them from elementary teaching and by selecting new members of the staff with a special view to their research capacity. It is quite possible to have a University over-equipped with facilities and under-equipped with men. Our inquiries lead us to the conclusion that every research man should do some teaching. It is desirable that teaching be not divorced from research, nor research from teaching. Professors might serve in both undergraduate and graduate departments. There is no better human material than the Canadian youth. Out of their undeveloped intellectual resources may be produced creative leadership in every department of knowledge.

6. If research and graduate work are to be properly developed, scholarships and fellowships must be established. These would enable selected students to continue their studies at a time when such continuance is likely to yield the best and speediest results, and would attract to the Provincial University of Ontario men from all parts of the Dominion. In the establishment of such scholarships private beneficence would find a fruitful field for investment and public money could be profitably employed.

7. There are many industrial, historical, scientific and economic problems that are distinctively Canadian. These should be a main subject of investigation in a great Canadian University. The problems for research, whether in science, literature or history, should be worthy of the time and mental travail spent upon them.

SALARIES OF UNIVERSITY TEACHERS.

1. Education is one of the most important processes carried on by the organized State. The value which the citizens of a democracy place upon education is a good index of its vitality and probable permanence among them. This value may be measured by two standards: (a) the status in the community accorded to the teaching profession, and (b) its material rewards. How does teaching rank in public esteem with Law, Medicine and Engineering? Are teachers of any degree called upon to play a part in functions outside their daily professional routine? Are the salaries of teachers sufficient to lift them above the level of financial anxiety, as they discharge one of the most difficult, delicate and divine tasks in the community? It is not possible to give definite and accurate answers to these questions. Merely to put them will give grave cause for reflection and action. If the teaching profession is to be kept vital there must be life and growth in the teacher. The teacher cannot remain in a rut. The teacher, to do his best work, must, as it has been well said, "irrigate the minds of pupils from a running stream, not from a standing pool." Study, mental recreation and travel are almost as essential to "the gentle art of keeping alive" mentally as food is essential to the body. The teacher's salary should be sufficient to provide for both bodily and mental needs. No teacher can give effective service if he is depressed by financial anxieties and a sense of injustice. What has been said is a plea for adequate salaries for good teachers in the realm of Higher, Secondary and Elementary education.

2. We would apply these general principles to the case of University teachers. Perhaps the most critical question now before the University and College public in America is that of salaries. The American Bureau of Education has issued a bulletin concerning the present status of salaries in 401 Universities and Colleges in

the United States. This bulletin declares that the general level of the salaries of College officers and teachers is far below what it was ten years ago. Financial efforts are now being made over the whole continent to raise the salary level. We believe that the recently adopted scale of salaries in the Provincial University should be maintained. It is now fairly up to the level of salaries in American Universities of similar rank. The salaries in Queen's and Western have also been placed upon a reasonably satisfactory level. In recent years on this continent many teachers in Universities and Colleges have gone into various departments of business at salaries far in advance of their former stipends, chiefly because they could not live in decency and comfort on the meagre amounts paid them by educational institutions.

3. The remedy for the situation is largely a financial one. Universities, however, must not expect successfully to compete, in point of salary, with industrial corporations. University teachers have compensations which do not fall to the lot of people in business life. The salaries of University teachers should be on an adequate scale.

(a) The scale of salary represents recognition of the real value of higher education.

(b) From the standpoint of the professor, an adequate salary gives him freedom for that continued study which is essential to effective work.

(c) From the standpoint of the University, adequate salaries mean (i) *a contented staff*, and, therefore, a more efficient and enthusiastic staff; (ii) *a staff kept at a high standard*. If salaries are low, the abler men will in time be called to other institutions and it will be impossible to induce the best type of scholar to go into academic work. In seeking to secure or retain good men, the Universities must in some degree be affected by the competition of industrial and commercial corporations; (iii) *a vigorous, influential and productive University*. Great teachers make a great university. If, through low salaries, the staff deteriorates, the welfare and progress of the University are unfavourably affected. The number of teachers who inspire students and really give tone to a University is never large.

(d) From the standpoint of the State, it is ultimately suicidal to lose the teachers of science from the place where scientists are trained. The professor is training younger men in scientific principles and applications and is himself increasing by investigation and experiment the bounds of knowledge. He is providing a supply of scientific men to take the place of himself and his contemporaries when he and they pass away. By the drain from collegiate institutions, the industries themselves would presently suffer. Who would train the future students of Pure and Applied Science? A serious diversion of teachers from the Universities would be a real calamity to the country. The country cannot well get on without science and a continuous supply of new knowledge and new scientific men.

4. While automatic salary increases may profitably be made in the lower grades of the teaching staff, we do not think it advisable to make such increases in the salaries of professors of highest rank. There should not be absolute standardization of the salaries of full professors. Increases should not be made merely according to length of service. There might be an ample minimum, but the maximum should be reserved for those who have either done real work in extending the realm of knowledge or are possessed of singular power of teaching. The law of salary by seniority has weakened many a University. The Universities should be free to offer a few salaries above the average to secure men of special distinction. These would be the prizes of the profession, which could be won by the very best men for the very highest work.

5. Universities are not subject to any system of government inspection, such as obtains in relation to elementary and secondary schools. The Universities—as the adult educational centres of the Province—maintain their own standards and supervise their own teaching. We believe that this work of internal supervision is of vital importance to the health and effectiveness of the institution. Academic freedom of utterance is a rightly prized possession; but academic indolence or infirmity cannot be too quickly checked. Some regular method should be adopted and kept in operation whereby the actual work of instructors may be known and its value sympathetically estimated. It is essential to find out who are the keen and promising men on the staff. The Heads of Departments, in conjunction with the Deans of Faculties, might systematically bring such information to the attention of the Academic Head of the University.

6. The administrative staff of a great modern University, the Librarian and his assistants, and the skilled technicians in various departments, are essential to smooth working, effective teaching and the supply of facilities to the students. Their salaries should be commensurate with the services they render.

TRANSFERENCE OF FIRST YEAR UNIVERSITY WORK TO THE SECONDARY SCHOOLS.

In many parts of this continent the State Universities have grown in numbers so rapidly that they are approaching the breaking point. The Provincial University of Ontario has shared in this astonishing growth. The aftermath of the war accentuated a situation which was already developing. The influx of delayed students since the war to some extent hastened the congestion, but it was inevitable in any event. Two sets of forces have contributed to this growth. The *external* forces are (a) the increase of population and wealth, (b) the appreciation of the value of special training, and (c) the growth and increasing efficiency of secondary schools. The *internal* forces are probably (a) the multiplication of courses and (b) the establishment of new departments. The most important of all these forces is the increase in the number of pupils in High Schools, and this increase seems likely to continue at a rate more rapid than the growth in the general population. In 1918 the number of candidates for matriculation in Ontario was 2,516; in 1919 the number had grown to 4,146 and in 1920, to 5,291. The compulsory attendance of adolescents will accelerate this increase in secondary school population.

How are the Universities to deal with these expanding numbers?

If the rate of increase in attendance at the Universities should grow so as to make the financial recommendations of this report inadequate, then either increased appropriations will be required or the functions of the different units in the educational system of the State must be re-defined. We recommend that before definite steps are taken further to increase staffs and erect new buildings to cope with this prospective situation, another solution be considered—viz: the transference of the work, in both Honour and Pass courses, now done in the First Year at the Universities, to such Secondary Schools as are, or shall be, able to do it.

1. Is it possible to do this in Ontario?

(a) The First Year Pass courses are similar in content in most departments to the Honour courses for Junior Matriculation. Full Honour courses in all departments are now provided in about fifty Secondary Schools. Without any change in organization, most of these schools could undertake to give instruction in all the pass subjects of the First Year of the University.

(b) The courses of study of the "Upper School" could be extended to include

Honour courses in *all* departments of the First Year in about twenty-five Collegiate Institutes of the Province.

(c) In all probability greater freedom will be given by the Department of Education to local communities in organizing High School courses to meet their particular needs. The local school authorities will be able to co-operate closely with the Universities and to establish such courses as may be desirable. The new elasticity of the Secondary School courses will probably make it possible to shorten the time of preparation now required for admission to the University.

(d) Local Boards of Education who established such advanced courses would probably require additional government grants for their maintenance.

(e) The prospective increase in the number of pupils attending Secondary Schools, wherever the Adolescent School Attendance Act is proclaimed, might delay, but would not necessarily prevent the establishment of these Honour courses.

2. What would be the probable result of making this transference in Ontario?

(a) *In relation to the Universities:*

(i) The usual University Arts course could be shortened to three years. Any student who wished to spend four years could devote his fourth year to graduate work, for example, for the degree of M.A. The medical course might be reduced to five years. Reductions could probably be made in other Faculties.

(ii) The Universities would be relieved of a great volume of work that could be equally well done in the Secondary Schools, and they could devote themselves to their proper sphere of more advanced studies. The Universities were established primarily to provide men and women with a liberal education and to train others for distinctive work in various professions. To realize these purposes, there has been at times a tendency to lower entrance requirements and take in poorly prepared students; virtually to enter the field of Secondary education, when High Schools were few in number or imperfectly equipped. Now that so many Secondary Schools are well staffed and equipped with laboratories, it would seem possible for the Universities to divest themselves of work which could be efficiently done elsewhere. This can be done by prolonging the Secondary School course so as to provide for full First Year work. The result would, in the long run, be the elimination from the overburdened University of most of its High School work. The University will have a better chance to be a University.

(iii) The University staff, would have more time for advanced work, for original investigation, and for closer personal contact with the individual student.

(iv) The undergraduates, male and female alike, would enter the University at a more mature age. The loss of University "atmosphere" for an initial year would be compensated by the additional receptivity and power which maturity brings.

(v) The character of the instruction provided in the Collegiate Institutes for First Year students would probably be as good as that now given to large classes in the Universities. The pupils would receive more individual attention when taught in smaller groups.

(b) *In relation to the Secondary Schools:*

(i) Secondary Education would be stimulated and elevated in the communities where these advanced courses are provided. The local Col-

legiate Institute would have more direct connection with the University; each would, in fact, be a local college for its community. The term "Collegiate" would regain its proper meaning.

- (ii) With greater scope for the individuality of the teacher under a more elastic Secondary School curriculum, and with the opportunity of teaching more advanced classes, the teaching staff in the Secondary Schools would rise to the educational demands of the new situation.
- (iii) The possibilities of beginning a University course would be opened up to a larger number of students in the centres where these courses are established. Students from adjoining localities would not be required to go so far from home to enter upon a University course.
- (iv) On the other hand, direct connection between the University and the smaller High Schools and Continuation Schools of the Province would be broken. The student from the smaller High Schools would have to attend a larger school for a year before entering the University. It is argued that this additional transplanting would deter such students from going on to the University.

Your commissioners suggest that this subject receive the fullest consideration of the Department of Education and the various Universities of the Province.

UNIVERSITY EXTENSION.

The functions of a modern University have been extended beyond the teaching of undergraduates and the training of their powers. There has been an intensification of courses at the higher stage, in the form of post graduate work and research. There has been an extension of university teaching to bring the advantages of the University to those who cannot attend its regular sessions. The University is no longer self-centred nor does it cherish an ideal of selfish culture. It seeks to serve the people and bring its resources as close to them as possible.

This University extension movement is a valuable part of the effort to expand and extend the education of adults. There is no reason why systematic education should cease with adolescence. The need for adult education under present conditions is greater than ever. Important economic questions, both in politics, industry and commerce, are constantly presented to adult citizens, and can be properly answered only by clear thought and accurate knowledge. Women, newly dowered with the franchise, are keen to be instructed in the great principles of government and in political and economic issues. The foreign-born population must be Canadianized. Many workers, who now have more leisure, desire to use it not only for amusement but for instruction, and would fill it with such materials of thought that they may become more useful citizens in the State. The number of young people who are taking courses in night schools and in Correspondence Institutes indicates another field for educational extension among adults. The more the Universities go out to meet the people, the greater will be the appreciation of a University's work and the more heartily will they be financially supported.

This extension work is carried on by the following means: (a) Correspondence Courses and Summer Schools, primarily for teachers in the public schools; (b) Popular lectures in local centres; (c) Tutorial classes, or systematic instruction outside the University, in definite courses; (d) Short courses for Farmers' Clubs (as inaugurated in the University of Toronto); (e) The Workmen's Educational Association.

This last, popularly known in England by its initials, the W.E.A., is one of the most interesting and significant of present day movements. It was launched in England in 1907. In 1919 there were 239 branches and over 25,000 students. The middle-aged working man makes an ideal student. After the period of youthful restlessness the return to the study of finer and higher things of life is a splendid performance. Two features marked the movement in England, (1) The teaching was given by highly-trained University men of the best type. (2) The subjects of study were not technical, nor even predominantly economic, but literary and cultural. Classes which began with political and economic subjects, frequently added historical, literary, and philosophic.

Similar development has characterized the movement here. In 1918, the W.E.A. was organized by men and women who wished to increase their general knowledge. In the first winter, 100 attended; in the second winter, the same number; and in the third winter, 160. A group of 30 meets in Hamilton.

The members meet in the evening to study economics, political philosophy, civic administration, public finance, psychology and logic, English literature, and the history of the British Empire. The fee is purposely kept to the minimum amount.

For all these departments of extension carried on by the Universities, sufficient financial support is needed. Members of the staff will probably be detailed to give their whole time to this branch of University work.

UNIVERSITY COLLEGE.

The University Act of 1853, following the early charters of the University of London, constituted the University of Toronto as purely an examining and degree-conferring body, and University College as a teaching body. The maintenance of University College, with adequate State endowment and on a strictly non-sectarian basis, became thus an integral part of the educational policy of the Province. The Federation Act of 1887 introduced a new order of things. The University of Toronto became a teaching body as well as an examining body; and undertook to provide instruction in certain specified subjects for the undergraduates of Federated institutions. The State's effort in higher education in Arts was divided into two parts—one part was carried on in University College; the other in the University of Toronto. The subjects taught in University College, viz.: Latin, Greek, Ancient History, French, German, English, Oriental Languages and Moral Philosophy, were to be taught also in the Federated Colleges. All the other subjects of the curriculum—Mathematics, Physics, Astronomy, Geology, Mineralogy, Chemistry, Biology, Physiology, History, Ethnology, Comparative Philology, Italian, Spanish, History of Philosophy, Psychology, Logic, Metaphysics, Education, Political Science, including Political Economy, Jurisprudence and Constitutional Law, and Constitutional History—were to be taught by the University of Toronto and to be open to the students alike of University College and of the Federated Colleges. By the University Act of 1906, the unity of the State educational effort was fully maintained. A common purse was provided for the University of Toronto and University College. They were recognized as representing the Provincial system of higher education in the liberal arts and in the sciences. The one Board of Governors controlled the affairs of both. In maintaining the College system in the University, the prosperity of University College was necessarily a fundamental principle. If University College were weakened, the whole federal system would be weakened. In 1906 the identity of University College, as the State Col-

lege in the complete system, was emphasized by the appointment of a separate Principal, Faculty and Registrar.

University College grew in numbers. It could not grow in range of instruction, because the subjects of instruction were limited by the Federation agreement. Naturally the greatest growth took place in the newly re-organized University, which gave instruction to students from all the colleges in a wide range of Arts subjects, and which presently included Faculties of Medicine, Applied Science and Forestry. The students of University College received their instruction mainly in the class-rooms of what had for years been called "University College," but which began to be known as "The Main Building" of the wider University of Toronto. The administrative officers of the University were housed here when the growing administrative work of the University called for more accommodation. This was secured at the expense of existing class-rooms. In the "Main Building" most of the non-laboratory subjects of the University Arts course are also accommodated.

The result of these developments has been that the identity of University College is in danger of being lost and its students are suffering from lack of proper teaching accommodation.

We believe that University College, the State Arts College in the Provincial University, should be maintained in dignity, efficiency and distinctness, and should have a definite local habitation. It is the oldest and most central part of the University. It houses "the humanities" and stands for the essentially liberal and cultural studies. We therefore recommend that:

(a) The present "Main Building" be called by its historic name, "University College" and be the home of that College.

(b) The University Administrative offices be removed to a new Administration Building. (i) The distinctively University Buildings—Convocation Hall, the Examination Halls and the Administrative offices—might thus stand together as one central group. (ii) The Administrative work of the University has been seriously hampered, if not impaired, by the lack of proper office facilities in the old building. (iii) Further accommodation would at once be provided for the students of University College—by far the largest body of Arts undergraduates.

(c) A new wing be erected, completing the quadrangle on the north side. This would provide greatly needed modern class-rooms, and private rooms for professors and instructors. This addition and the removal of the Administrative offices would make it possible to give adequate accommodation in this building, for years to come, to the non-laboratory University Arts subjects, such as Economics, History, Philosophy, Mathematics, Italian and Spanish. In due time residences for University College men and women could be erected in proximity to University College Building. Such residences would undoubtedly foster the spirit of College loyalty and tend to preserve College identity.

THE ONTARIO COLLEGE OF EDUCATION.

When the building now occupied by the Ontario College of Education was erected only part of the original plan was carried out. Some of the structures on the property purchased were utilized temporarily for school purposes. Although quite unsuited to the work of the school they have never been replaced. First the war and afterwards uncertainty regarding the status of the Faculty of Education postponed building operations. The relation of the College to the Department

of Education and to the University is now permanently settled and plans for adequate accommodation should be carried out. The following are urgently needed:

(1) Additional Class-rooms, (2) Household Science and Manual Training Rooms, (3) Art Rooms, (4) Assembly Hall, (5) A Gymnasium. The cost of the building will probably be about \$300,000.

After a careful examination of the premises, we recommend that this work be proceeded with as soon as possible.

The budget of the College of Education is to be voted annually by the Legislature as part of the estimates of the Department of Education.

The new arrangements for teacher training in the Province will make it possible to develop graduate work in the College of Education and to provide such advanced instruction as is now sought by Canadian students in Chicago and Columbia Universities. For the highly-trained, broad-minded, experienced educational leader in this Province, the field is wide.

ROYAL ONTARIO MUSEUM.

The construction of this Museum was recommended by the University Commission of 1906. The services it has already rendered to the University of Toronto and the Province generally, more than justify its erection. One-half of the cost of maintenance is provided by the Government and one-half by the Provincial University. Its contents are of priceless value; some collections are absolutely unique. The greater part have been acquired through the generosity of individual donors.

(a) To the people at large the Museum is of value on the æsthetic side. (b) To the industries, its collections of robes, tapestry, furniture, pottery, etc., are of great practical use. Napoleon III, by his establishment of local museums throughout France, gave an enormous impetus to the development of artistic craftsmanship and to the consequent enrichment of his country. Museums will serve a similar practical purpose in this Province. (c) To the University, the Museum is essential for teaching purposes in various departments. (d) It is proposed to put collections of material at the disposal of Collegiate Institutes and other places of learning throughout the Province.

At the present time, the Museum is so overcrowded that valuable articles cannot be publicly exhibited. Its teaching power is limited by want of space. We believe it to be desirable that the new wing in extension of the south side of the Museum should be proceeded with in the future. The erection of this wing would accommodate the University Departments of Mineralogy and Geology, in close proximity to their great collections now in the Museum, and would release space in the Chemistry and Mining Building for the growing department of Chemical Engineering.

CAPITAL GRANTS FOR BUILDINGS.

1. The building programme of the Provincial University was largely laid down before the war. It is not something new or hastily devised. What was needed before the war is urgent to-day.

2. We feel that the Government may properly and helpfully give aid to the building programmes, as well as to the maintenance of Queen's and Western Universities.

3. We recommend that grants be given on Capital Account for the erection of buildings that are immediately necessary and on which construction should be begun as soon as practicable. The amount recommended will probably cover the building programme of the next few years.

4. Wherever possible, new buildings should be so planned as to meet immediate needs and to be capable of extension when further demands on their space arise.

5. After giving due consideration to the order of urgency in the building programme of the Provincial University, we recommend that the amount of \$1,500,000 be granted forthwith for the erection of the following buildings:

Heating Plant	\$275,000
Anatomy Building	400,000
Administration Building	200,000
North Wing of University College	300,000
Forestry and Botany Building	200,000
Women's Gymnasium, etc.	125,000
	<hr/>
	\$1,500,000

6. We recommend that the amount of \$340,000 be granted to Queen's University forthwith for buildings and equipment urgently needed:

Extension of Mechanical Engineering and University's share of heating plant	\$125,000
New Library Building	150,000
Repairs and extensions to existing buildings	50,000
Equipment for Applied Science	15,000
	<hr/>
	\$340,000

7. We recommend that the sum of \$800,000 be granted to the Western University towards the erection of its new Arts and Science Buildings and Library. The Library can be in the meantime safely housed in part of the Arts Building. This grant will probably be all that the Province will be asked for on Building Account for many years.

8. The total amount required for immediate building necessities is \$2,640,000. This might be borrowed on Provincial Capital Account, and provided as required over a two or three-year period.

FINANCIAL SUPPORT OF THE PROVINCIAL UNIVERSITY.

This question is vital to the maintenance and development of the Provincial University. A well-equipped University, which also carries on post-graduate work and by the excellence of its staff attracts students from the whole Dominion, will, through increasing attendance, staff, equipment, and departments, require an increasing revenue. The total expenditure in 1906-07 was \$411,696. In 1919-20 this had risen to \$1,509,311; in 1920-21, to \$1,994,938. The total grants for maintenance from the Province to the University of Toronto have, in recent years, been as follows:

1910-11	\$504,647.31
1911-12	488,887.00
1912-13	481,368.70
1913-14	419,833.60
1914-15	707,618.19
1915-16	567,914.49
1916-17	669,617.96
1917-18	749,962.62
1918-19	775,499.90
1919-20	952,000.00

These figures show that the Province has not been ungenerous to the University.

We agree with the University Commissioners of 1906 in believing that the University income should be fixed upon a reasonably definite basis, and that this basis should provide an amount which will automatically increase with the growing population and wealth of the Province. A certain percentage of the Succession Duties would provide such a basis. On this basis the income was fixed in 1906. We believe it still to be advisable.

The University Act of 1906 provided that for the maintenance of the University and for University College there should be paid yearly to the Board of Governors a sum equal to fifty per cent. of the average yearly gross receipts of the Province from Succession Duties, the average to be determined by and based upon the gross receipts from such duties for the three years ended on the 31st day of December next preceding the day on which the first instalment of the year is to be paid. This provision was limited by an amendment in 1914 to a maximum of \$500,000 in any year. The rapid growth of the institution and its needs was scarcely realized at that time. Such growth in University education is now a marked phenomenon throughout the English-speaking world. Had this limitation not been made, the University would have received in the last six years the additional sum of \$1,310,839, and this would have met all its requirements both for maintenance and buildings.

The Provincial Revenue from Succession Duties during the past ten years has been as follows:

1910-11	\$963,195.49
1911-12	773,712.39
1912-13	1,062,694.87
1913-14	1,196,818.36
1914-15	1,615,777.84
1915-16	2,333,700.03
1916-17	3,110,495.24
1917-18	3,108,826.88
1918-19	3,366,823.94
1919-20	4,014,000.00

We recommend that once more for the maintenance of the University and of University College there be paid yearly to the Board of Governors a sum equal to fifty per cent. of the average yearly gross receipts of the Province from Succession Duties, the average being calculated on the receipts of the three preceding years.

(a) This method is a return to a well-tried and satisfactory arrangement.

(b) It will provide a revenue large enough to meet present and prospective needs and to secure a balance from which ordinary building requirements in the future can be met.

In 1919 it would have given	\$1,425,503.69
In 1920 it would have given	1,597,691.01
In 1921 it would have given	1,748,275.13

(c) The experience of the past fifteen years shows that this income would have kept pace with the needs of the University. If, however, in the future, the return from this source should exceed the needs of the University, this percentage should be readjusted to meet the changed situation.

(d) The assignment of this definite source of income to the Provincial University will prevent any criticism to the effect that in giving grants-in-aid to other Universities in the Province, the Legislature is diverting funds from the Provincial institution and is thereby crippling its efficiency or stifling its growth.

That the income proposed for the University is not excessive may be shown by a statement of the budgets of eight great Universities in the United States:

	1901	1910	1918	1920-21
Michigan	\$500,000	\$1,777,425	\$2,552,800*	\$3,819,000*
Wisconsin	400,000	1,755,000	2,598,287*	4,262,085*
Illinois	450,000	1,639,792	2,825,409*	3,532,785*
Minnesota	350,000	813,784	2,678,453*	5,059,591
California	500,000	1,625,000	3,486,625*	4,432,282*
Harvard	.....	.....	.....	4,157,315*
Yale	.....	.....	(1918-19)	2,667,518
Pennsylvania	.....	.....	.....	3,269,552*
Toronto	233,283	777,800	1,191,602*	1,993,000*
	(1902)			

The "Statistics of State Universities and State Colleges," issued by the American Board of Education for the year ended June 30th, 1918, gives the "total working income" of the State Universities as follows:

Michigan	\$2,647,833.00
Wisconsin	2,748,287.00
Illinois	2,075,409.00
Minnesota	2,803,703.00
California	3,732,986.00

The details of the expenditure by the Board of Governors are laid before the House. Elsewhere in this Report, recommendation is made that fullest publicity be given to the work and plans of the University by the appearance of the President or a representative of the Board before the House, to report upon and explain the past year's operations and to set forth projected developments in the future.

*Exclusive of Buildings.

AID TO QUEEN'S AND WESTERN UNIVERSITIES.

1. Since 1907 the Province has made annual maintenance grants to Queen's University, beginning with grants for the School of Mining and the Faculty of Education.

1907-08	\$51,000
1908-09	66,500 ✓
1909-10	72,500 ✓
1910-11	74,000 ✓
1911-12	74,000 ✓
1912-13	76,000 ✓
1913-14	74,000
1914-15	69,000
1915-16	127,000 ✓
(Including for the first time grants to Arts and Medicine)	
1916-17	122,000 ✓
1917-18	137,000 ✓
1918-19	137,000 ✓
1919-20	177,000

The revenue for 1919-20 including the Government grant of \$177,000, yet fell short of meeting the expenditure by \$41,000.

We believe that a *definite* yearly grant, for a period of five years, should be made to this University. On this basis it will be possible for the University authorities to have an approximate knowledge of their financial resources and to arrange their expenditure accordingly. We recommend that there be paid, out of Consolidated Revenue, through the Educational Estimates, a grant for maintenance to Queen's University of \$275,000 for the first two years, and \$300,000 for the next three years.

2. To Western University at London, the Province has made annual maintenance grants as follows:

1910-11	\$10,000 ✓
(for Public Health Department)	
1911-12	15,000
1912-13	15,000 ✓
1913-14	15,000 ✓
1914-15	20,000 ✓
1916-17	60,000 ✓
(Including grants to Arts and Medicine)	
1917-18	60,000 ✓
1918-19	65,000 ✓
1919-20	84,000

The new Medical Building will be occupied in the near future, and increased maintenance charges will follow the erection of the new Arts Buildings.

We recommend for maintenance a grant of \$200,000 a year for the first two years, and a grant of \$250,000 for the next three years.

3. In the case of the grants to Queen's and Western Universities, we recommend that at the end of five years these sums be readjusted for a further period of five years by a Court of Reference to be appointed by the Lieutenant-Governor in Council.

The Court, in making such readjustments, should take into account such considerations as the number of students, efficiency of past work, educational opportunities in the district, and the amount of local self-help. Both Queen's and Western have received a large amount of local support. This will doubtless be continued and extended. "To supplement and encourage local effort" is a sound principle of Government aid.

DIRECT EDUCATIONAL TAX.

1. Revenues for higher education are secured in various ways in different Provinces and States.

Alberta.—Legislative grants and 50% of receipts from Succession Duties.

British Columbia.—Annual Legislative grant.

Manitoba.—Annual Legislative grant.

Saskatchewan.—Tax of two cents per acre.

New Brunswick.—Annual Legislative grant.

In the United States, the usual method is to levy a mill tax on property for maintenance, and to vote buildings and needed additional maintenance by special appropriations. For example:

University of Minnesota:

- (a) Mill tax, 23/100 of a mill, yielding \$408,000.
- (b) Appropriation of the present biennium \$1,865,000.
- (c) Special appropriations for agricultural extension \$122,000.

University of Michigan:

- (a) Mill tax of $\frac{3}{8}$ mill on each dollar of equalized value in the State, providing \$1,687,500 for current expenses.
- (b) Specific appropriations for buildings.

University of Illinois:

- (a) Mill tax of $\frac{2}{3}$ mill on all property in the State, yielding in 1920, \$2,530,136.
- (b) Land Grant Act and other Federal Acts yielding \$313,500.
- (c) Special appropriations for buildings.

University of Wisconsin:

- (a) $\frac{3}{8}$ mill tax for maintenance.
- (b) Special appropriations for additional current expenses, buildings and permanent equipment.

2. The sums asked for education are large. Can they be provided in view of existing taxation and pressing demands for other purposes? While taxation is heavier than it was in former days, it must be remembered that:

- (a) Expenditure on education is productive and constructive; it is really a capital investment which yields large returns.
- (b) Countries much more heavily taxed than our own, notably the United Kingdom, are devoting largely increased sums to education, as the best means of solving social problems and effecting permanent improvement.

(c) The increase in the total sums collected in taxes is largely due to the decreased value of the dollar, and does not represent a corresponding increase in the proportion of the people's property and income.

(d) The revenues collected by the Provinces are very much less than the revenues collected by the Federal and Urban Municipal Governments:

1919. Federal revenues per head	\$35.42
1918. Provincial revenues per head	8.04
1919. Urban Municipalities of 10,000 and over (2,980,000 population in all per head) ..	45.47

(e) Of these Provincial revenues, a very large proportion comes, not from Provincial taxes, but from (1) Federal subsidies, and (2) Crown Land resources—revenue sources which are not, in any appreciable degree, available in the States to the south of us.

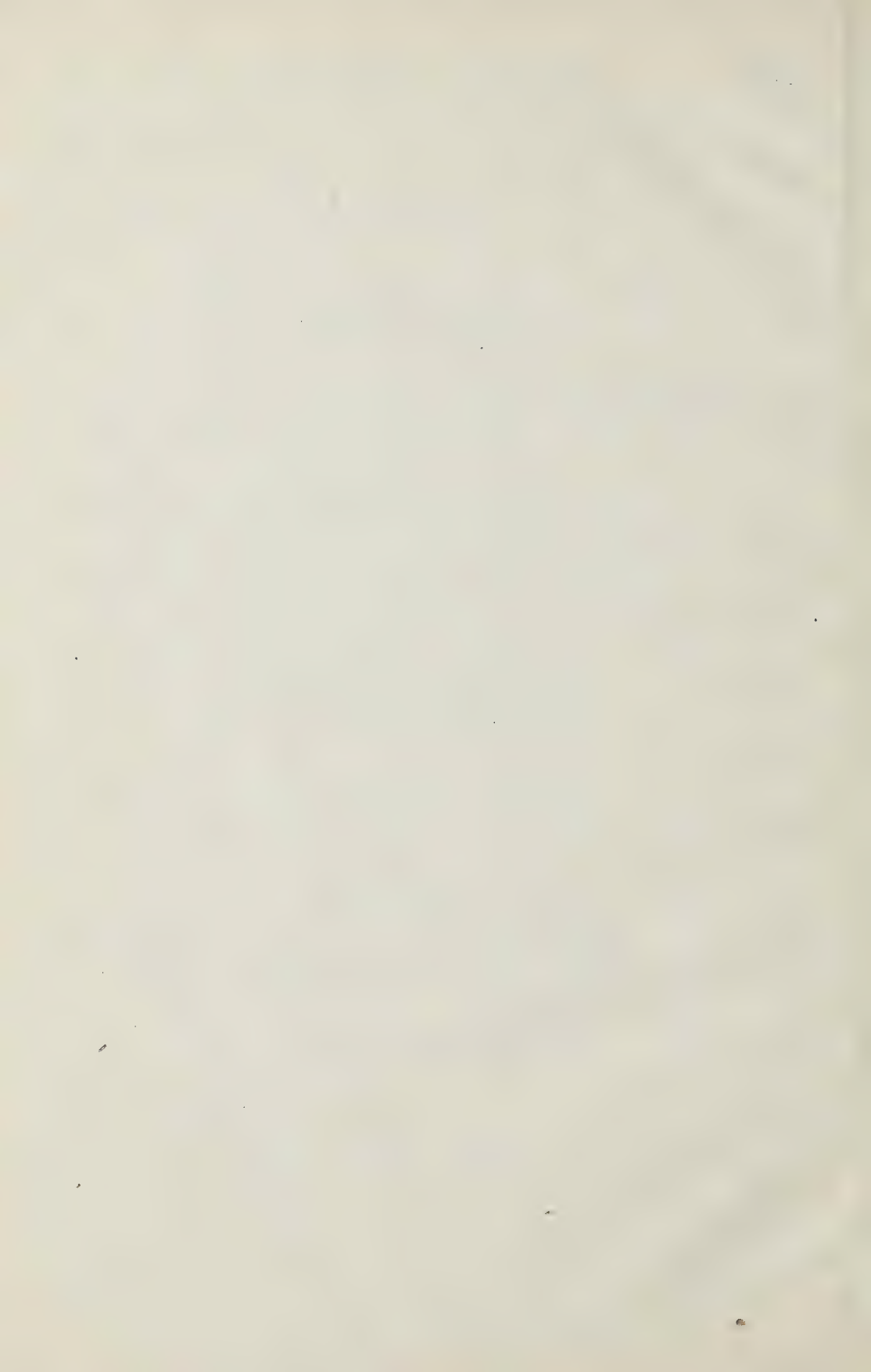
3. If the revenues of the Province are not sufficient to meet the expenditures of the Province, including the present and prospective needs of primary, secondary and higher education, we would recommend the levying of a direct tax of one mill on the dollar on the municipally-assessed value of the rateable property of the Province (excluding incomes, in order to secure greater equalization of assessment). It might be necessary to have a Provincial Board of Equalization. When Saskatchewan passed the Public Revenues and Wild Lands Tax Act, Provincial equalization became necessary. The 1914 Report of the Ontario Public Roads and Highways Commission gave some striking instances of variation in local assessment. The Ontario War Tax of one mill on the total assessment (including assessment for income) yielded over \$2,000,000 a year. A small tax on rateable property would have much in its favour, in its certainty, stability, growth in returns and ease of collection.

This tax of one mill on the dollar should be earmarked for education in general—elementary, secondary and higher. A definite and increasing sum would be provided, not subject to reduction by other demands. This sum, so raised by direct tax, might well be devoted to (1) the extension of rural school education; (2) the aiding of urban centres in providing part-time instruction, under the provisions of the Adolescent School Attendance Act; and (3) the extension of facilities for higher education through Collegiate Institutes and Universities. The normal taxpayer's dislike of taxes would apply with less force to a Provincial tax for education than to a tax for any other object. The desirability of adequate and wise support of education is almost universally admitted.

All of which is respectfully submitted,

(Sgd.) H. J. CODY, *Chairman*
J. S. WILLISON
J. ALEX. WALLACE
T. A. RUSSELL
A. P. DEROCHE
C. R. SOMERVILLE.

Feb. 10th, 1921.



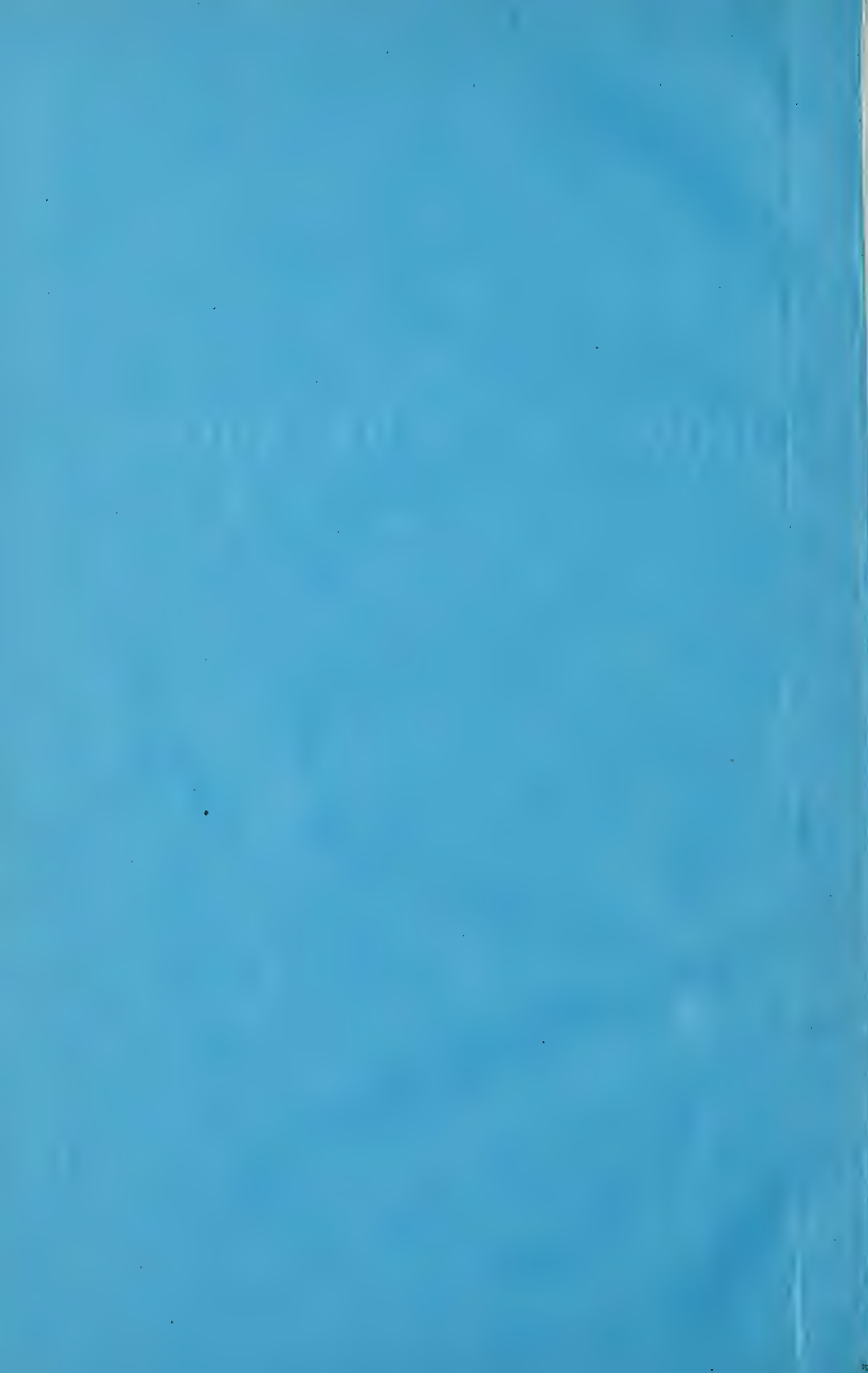
REPORT
OF
ROYAL COMMISSION
ON
UNIVERSITY FINANCES
(VOL. II)
APPENDICES

PRINTED BY ORDER OF
THE LEGISLATIVE ASSEMBLY OF ONTARIO



TORONTO:
Printed by CLARKSON W. JAMES, Printer to the King's Most Excellent Majesty

1921



REPORT
OF
ROYAL COMMISSION
ON
UNIVERSITY FINANCES

APPENDICES

PRINTED BY ORDER OF
THE LEGISLATIVE ASSEMBLY OF ONTARIO



TORONTO :
Printed by CLARKSON W. JAMES, Printer to the King's Most Excellent Majesty
1921

Printed by
THE RYERSON PRESS.

UNIVERSITY OF TORONTO,

December 6, 1920.

TO THE HONOURABLE AND REVEREND H. J. CODY, D.D., LL.D., CHAIRMAN OF THE
UNIVERSITY COMMISSION,

DEAR DR. CODY:

By the authority of the Governors and Senate of the University of Toronto I am submitting to you herewith a Statement with Reports setting forth the case of the University of Toronto for enlarged support by the Province of Ontario.

I have the honour to be,

Your obedient servant,

ROBT. A. FALCONER,

President.

CONTENTS

	PAGE
APPENDIX I.—Statement of University of Toronto	7
II.—Statement of Alumni Association of University of Toronto	70
III.—Statement of University College Alumnae Association, University of Toronto	80
IV.—Statement of Engineering Alumni Association, University of Toronto	82
V.—Statement of Professor Alexander	88
VI.—Report of Trustees of Queen's University	89
VII.—Statement of Western University	128
VIII.—Research Conditions. Prof. J. C. Fields, Royal Canadian Institute ..	144
IX.—Statement of Workers' Educational Association	152
X.—Statement on Taxation, by W. C. Good, Paris	155
XI.—Statement of United Farmers' Representative	157
List of Names of Persons who Attended before the Commission	159

APPENDIX I

UNIVERSITY OF TORONTO

GENERAL STATEMENT

The Provincial University.—The fortunes of the University have been very intimately associated with the life of the Province of Ontario from its earliest days. The first Governor, John Graves Simcoe, inaugurated the proposal that a college or university should be erected, and his recommendation was supported by the Legislative Council and House of Assembly with a magnificent grant of land for which sanction was given by the Crown in 1798, but his real purpose was not to be realized in his own time nor indeed except through years of wearisome and precarious struggle. At last, however, the Provincial University became firmly established in Toronto, and it must always remain the peculiar creation and property of the people of this Province, who are bound to provide for their youth such education as will continue to be worthy of their progress in intelligence and wealth.

Federation.—The character and destiny of the University have been further established by the undertaking to maintain the State University in efficiency given to Victoria and Trinity Universities at the time of their federation with the University of Toronto. This unique organization has created for this University a distinctive character. Federation came gradually, and its results have been gradually stabilised. It brought unification of collegiate and professional interests, and has not only prevented costly duplication, but also a variety of standards in higher education. To-day the degrees of the University of Toronto are recognized as comparing favourably with the best on this continent, and three colleges, besides the State college, in federation co-operate for the maintenance and development of one high standard in the Faculty of Arts. Communications are submitted from the federated Colleges.

Unification of the University.—Before Federation the diversity of interests in higher education was such that this Province was unable to provide for itself a University towards which the Legislature was either able or willing to grant such support as for many years previously had been given to State Universities in the United States. These great institutions had a start over the University of Toronto in their development. With the success of Federation, however, and with the carrying out of the constitution provided by the University Act of 1906 the University of Toronto entered upon a new and most successful period of its development. Arts became unified and strengthened by the addition of St. Michael's College in 1910. Some years earlier the rival Schools of Medicine in Toronto had been brought together into one great Faculty. In 1906 the School of Practical Science was transferred from its former direct relationship to the Government and became the Faculty of Applied Science, and in the same year the Faculty of Education was created to train the teachers of the Province of the higher grades. The University to-day, therefore, has grown into a vast, varied and complex organization.

Attendance of Students.—From the year 1897 to 1906 the attendance in the University and the School of Practical Science increased from 1,350 to 2,500, a little less than 1,200 in nine years, but in the first year under the new constitution numbers rose rapidly by 500 annually until 1909-10, when they reached 4,000. Standards were raised and courses were lengthened, with the result that there was very little change in the numbers until the first year of the war, 1914-15, when they stood at 4,400. During the war they declined rapidly. In the session 1919-20, however, the first full session after the war, they rose very unexpectedly to over 5,200. This year, at present, there are about 4,600 in attendance. But this reduction is more apparent than real, except in the case of the attendance at the Ontario College of Education, which is reduced by the removal of over 300 candidates for first class certificates from that College to the Normal Schools. The decline otherwise is due to the transfer to the College of Dental Surgeons of the teaching of Anatomy formerly given to students in Dentistry, owing to the impossibility of providing for them in our present anatomical quarters, and to the discontinuance of the matriculation class for returned soldiers. In Arts, however, the attendance this year is greater than last year, and is really larger than it has ever been. In Medicine the numbers of full-time students is slightly above that of last year. In Applied Science the attendance is practically the same. The congestion at present is, of course, partly due to the presence of the returned soldier, though chiefly so in the Faculty of Medicine. Though there may be fluctuations, it would appear that in Arts and in Applied Science the numbers will not likely be permanently reduced in the future, but under the necessary limitation which has to be made in Medicine they will

probably fall in a few years to perhaps 700 in that faculty. Other departments, however, are likely to increase, especially Graduate Work, the New School of Commerce and Extension.

If the standards of entrance are raised in the Faculty of Arts, as has recently been done in the Faculties of Applied Science and Medicine, the students in the three largest Faculties of the University, as well as in the College of Education, will be of distinctly university grade, and no reduplication of instruction, such as may be given in the Collegiate Institutes of the Province, will be carried on in the University.

Origin of Students.—Tables are herewith submitted to show the origin of the students both as regards their homes and the occupations of their fathers. Attention is drawn to the wide representation of all parts of the Province in this distribution of students, and to the fact that the homes from which they come represent in a remarkable way almost every variety of occupation in the Province. They show how thoroughly democratic is the character of the student body.

Building Activity.—The record of attendance provides the explanation of the great activity in building which continued for seven years after the present Board of Governors took office. New laboratories had to be constructed, the Library extended, and buildings erected to accommodate teaching departments, old and new. The Governors drew up a carefully considered plan of building, including developments for administration, for it was evident that the conduct of the affairs of a great University like Toronto could not be carried on under the conditions that might have been sufficient when the various interests of the University were more or less independent. Unfortunately, however, though the Governors had reason to hope that their programme would be carried out, a stop was put to construction by the limited funds placed by the Government at their disposal, and even before the war this kept the University in a position of great congestion, hindered development in research and seriously interfered with its work otherwise. At the outbreak of the war the former activities of the University were directed into new channels. The attendance dropped rapidly, building ceased.

Present Conditions.—But again, in the first year of peace, an unprecedented attendance caused the University to face the old problems in a more acute form; the former number of students would have overcrowded the old accommodations, but one thousand more were in attendance. This is the situation in which we find ourselves to-day, except that one new building, now nearing completion, has been added for the Departments of Applied Mechanics and Electrical Engineering. Many of the departments of the University will be seriously crippled unless immediate action is taken in carrying out the building programme, which is submitted in the Appendix to this Statement. Special statements are handed in by the heads of the Departments of Anatomy, Botany and Political Science, but the requirements of University College and for women students are scarcely less urgent. The Principal of University College has submitted a memorandum setting forth the building requirements of the College. Undoubtedly it has been suffering from lack of proper teaching accommodation and of residences, and as the oldest and most central part of the University its needs should receive immediate attention. It is most unfortunate that the revenues at the disposal of the Governors were insufficient to complete these necessary building operations before the war, during the period when construction was less than half its present cost.

Results of Too Small a Staff.—The large attendance of students created another problem. The staff of the University had never been large enough. As early as 1891, in the Blake Report, attention was drawn to this fact, but the difficulties grew as the numbers grew. Men who had capacity for doing graduate and research work were compelled to undertake so much undergraduate instruction that both time and energy were exhausted, and young men joining the staff were overloaded with routine work in class-rooms and laboratories, and were thus deprived of the opportunity which they should have had of laying a foundation for productive scholarship or scientific research. The numbers of students in several departments are so large that some lectures have to be delivered twice, three, or even four times, by one teacher, a routine which becomes deadening.

But the staff was enlarged from year to year as is shown by figures herewith submitted. In 1904-5 it stood at 210 (exclusive of federated universities), whereas in the present session it has risen to 511 with certain appointments still to be made. An increase in our present staff, however, is necessary even should the number of undergraduate students be reduced. Only thus will it be possible for the University to enter upon an enlarged programme of graduate and research work.

Faculty of Arts.—It must not be supposed, however, that either in University College or in the Faculty of Arts of the University we have yet reached our limit even as regards undergraduate work. Changes will be made in the curricula to meet the changing conditions of the time, and new departments and sub-departments must be added. It is to be expected, for example, that the departments of Political Science

and History, including Canadian History, will grow rapidly, and that with the general rise in the education of the Province greater attention will be given to the study of language and literature. In fact, unless they are not only maintained, but developed, the whole University will suffer. A wider diffusion of education on its humanistic side is required for our people, who now find themselves in the forefront among the most highly developed nations of the world. Also, if we are to judge by the experience of other Universities, both in Britain and in the United States, the new Department of Commerce will soon assume a large importance, and it will be necessary not only to provide accommodation, but to make new appointments of men who are competent to deal with the practical aspects of business administration and trade.

Graduate Work and Research.—But the direction in which the University must make the most distinctive progress is in graduate work and research. One chief function of a University is to extend knowledge and to train others who will extend knowledge; to be the home of productive scholarship and scientific investigation and to be the source from which there will go forth a stream of highly trained young Canadians competent to carry through this land the most advanced ideals and methods both in science and in scholarship. Graduate work will be of great advantage to the nation and will react beneficially upon the Province even in a material way. No Ontario youth should be under the necessity of leaving his own province in order to secure the most advanced instruction and the best guidance in graduate work and research which are to be afforded on this continent. Ontario must maintain the lead, and we have enough experience to prove to us that if we offer opportunities, not only shall we retain our own students who may be unable to go abroad, but we shall draw a very large number of graduates of other Canadian Universities, and thereby create a community of sentiment which will be of incalculable influence in unifying this Dominion in the future.

Research work is very expensive; it is impossible to prove its value by immediate results, but it is nevertheless essential. Good results cannot be obtained unless an investigator has uninterrupted periods of time for his work. Already, as is shown in the memorandum submitted, the University of Toronto has done much research, and a new impetus has been given to it by a special appropriation of \$15,000 in the first year after the war, and \$75,000 during each of the last two years. This is in addition to the research done under the special endowment of \$100,000 created in connection with the Antitoxin Laboratories and an annual grant of \$3,750 made to these laboratories for the same purpose by the Provincial Government. Attention is drawn to a careful Memorandum on Graduate Work and Research.

If graduate work is to be developed a system of scholarships must be established, not only to enable our students who have the inclination to undertake graduate work, but also to draw others from the Dominion at large. The Blake Scholarships awarded at Matriculation have been an inestimable boon to this University and to the Province. They have drawn into university life many of the finest minds who might otherwise have been diverted from an academic career. What these scholarships do for undergraduate work in the university should be done for graduate work either by a new foundation established from private sources, or, until this is provided, out of the regular University finances.

The Library.—The function of the Library in the life of the University can hardly be overemphasized. At present it contains about 160,000 bound volumes and 52,000 pamphlets, and in many departments is well provided. Ordinary undergraduate work in most departments may be maintained with moderate annual appropriations, but for graduate work there must be large outlay. In comparison with other universities the annual appropriation for the Library is very much too small. Also when additions are made to the Library building special provision should be made for graduate students. A Memorandum on the Library is appended.

Faculty of Medicine.—In recent years the Faculty of Medicine has made great advances. The erection of the Toronto General Hospital, of the University Pathological Laboratory in close proximity to it, and the equipment of the Departments of Biochemistry and Physiology, have placed this Faculty in an enviable position. Last year the gift made by Sir John and Lady Eaton of \$500,000 for the development of Medicine and Pediatrics made possible for the first time in Canada the appointment of a full-time professor in Medicine, and already the good results are becoming manifest.

Word has just been received that the Rockefeller Foundation will appropriate \$1,000,000 to the University of Toronto for the general endowment of the Medical Department upon condition that the University carry out a programme of development, including items to be provided from funds other than those contributed by the Rockefeller Foundation. Three of these items are the erection of a new Institute of Anatomy (approximately \$600,000); an addition to the Pathological Building for Clinical Laboratories (approximately \$300,000); and an annual increase for salaries on the scale set forth in the last estimates of the Board of Governors.

As will be observed in the appended memoranda of the Dean and the Associate Dean of Medicine this Faculty aims at turning out general practitioners who will be not only acquainted with the approved methods of practice, but who are able to keep abreast of new discoveries; large laboratories well equipped are necessary if the student is to get the habit of independent observation and understand the functions of organs and tissues; while in the hospitals there must be adequate provision made for the diagnosis and treatment of diseases. Toronto is equipped very badly with laboratories in Anatomy and Pharmacology, moderately in Hygiene, not at all in the Clinical Departments.

In addition to this the supply of teachers is quite insufficient. There should be enough instructors to allow time for original investigation. Unless the University leads in original thought medical science will retrograde, and special research institutes can never exonerate a university from this duty. One great advantage possessed by this University is the close connection that exists between it and the Public Health Laboratories.

The reorganization of clinical teaching must be continued, especially in the departments of Surgery, Obstetrics and Gynaecology; Pathology also must be much enlarged; Psychiatry needs great expansion, and Hygiene is only at its beginning. Though the income from the magnificent gifts made by Sir John and Lady Eaton and the Rockefeller Foundation will go a long way towards this reorganization, it must not be supposed that it will be nearly sufficient for the development that is necessary to place this Faculty abreast of the best on the Continent.

Antitoxin Laboratories.—Connected with the Department of Hygiene are the Connaught Antitoxin Laboratories, which were established to provide facilities for research in Preventive Medicine, Public Health and Hygiene and for the manufacture of diphtheria, tetanus and anti-meningitis sera, Pasteur treatment, smallpox vaccine, and sera and antitoxins for other diseases. Through these laboratories it has been possible for the Government of the Province to distribute sera and antitoxins free, and the Canadian Army was supplied during the war. The research in Preventive Medicine conducted in these laboratories has already been referred to. A statement regarding the work of the laboratories is appended.

A table is submitted making a comparison of Toronto with other leading medical schools of this continent in regard to the number of students in attendance and the expenditure per student.

The direct results of science in ameliorating the conditions of human life are strikingly manifest in medicine. In the laboratory the sources of diseases have been discovered, and their remedies provided, and the combination of laboratory methods with scientific clinical observation has resulted in the last two generations in adding ten years to the average human life in civilized countries. Expensive as is the equipment and maintenance of a first-class faculty of medicine, if it demands high standards of education and promotes research, it soon makes not only a province, but mankind, its debtor.

Faculty of Applied Science.—The Faculty of Applied Science has been organized into many departments to meet the developing requirements of the Province, and to keep pace with the rapid expansion of engineering and of the applications of Science to industry. During the past two years the attendance has been the largest in the history of the faculty, and the indications are that the present numbers will be maintained or increased. It is, therefore, certain that a much greater expenditure may be anticipated. Indeed, this faculty will always be one of the most expensive in the University. It must of necessity be so, for the cost of the apparatus and machinery required for instruction and research is very great, and they become antiquated so soon that constant renewals must be made. The development of the natural resources and the industries of the country has been and will be dependent upon the technical education that is given in the Faculty of Applied Science. The prosperity of the Province demands that this Faculty be maintained in a state of high efficiency. Efficiency in any one department depends upon a thorough co-ordination of several related departments, as *e.g.*, Mining Engineering is interlocked with Chemical, Electrical, Mechanical and Metallurgical Engineering. Of recent years Mining and Metallurgy have been greatly extended in this University to meet the needs of the Province. Within a few years the centre of the mining industry of Canada has been transferred from Montreal to Toronto. From this city the railways lead north into that section of the Province of Ontario which, in the richness of its minerals, has already far exceeded the dreams of its most sanguine promoters and which as yet is really known in but a few localities. The University must provide not only the scientific explorers, but the mining engineers to develop the wealth that lies hidden in that north country to which Toronto gives access. The careful and suggestive report which the Dean has prepared sets forth the present condition of the Faculty, its immediate requirements, with some indication of their cost, the aim of the Faculty in relation to the expansion of the country, and the connection of industrial development with its progress.

Faculty of Forestry.—Though the Faculty of Forestry has not grown as have others within the University, it has played an important part in the material development not only of the Province but of the Dominion, and there has always been a large demand for its graduates. The permanent productivity which will result from scientific care of the forests makes the work of this Faculty of high importance, and it is seldom realized that a much larger income has accrued to the Provincial Treasury from the forests than from the mines. At first sight it might appear that there is duplication in the work done in the Faculty of Forestry and in the Agricultural College at Guelph. But this is not the case. At Guelph forestry is studied only in so far as concerns the farm wood-lot. In the University the aim is to produce foresters whose life-work will be to conserve and develop the forest resources of the Province and Dominion. This training requires the best of the basic sciences as they are taught in the University, and the practical experience which is to be acquired from the observation and study of phases of the manufacture of lumber which have their headquarters in a large city like Toronto. The Dean of this Faculty outlines in a Report appended four directions in which development should take place:

1. Establishment of a practice camp and forest experimental station.
2. A post-graduate course leading to the degree of Master of Forestry.
3. A forest-ranger's course.
4. A forest-products museum.

It is also assumed that any development of this course is conditional upon the erection of a new building in which Botany also will be housed.

University Extension.—Unlimited opportunities are opening out for university extension. In the report submitted a summary is given of the main divisions under which this work is now being conducted.

1. Teachers' classes together with Summer Sessions for the purpose of enabling teachers to secure a degree in Arts. This department is now serving two hundred teachers with room for expansion for many times that number.

2. Local lectures are given in various parts of the Province. The development of these lectures depends only upon the size of the teaching staff of the University, and the time at its disposal for doing outside work.

3. Tutorial classes are conducted both in Toronto and in the Province. The extension of this work also is bound up with the growth of the teaching staff.

4. Special attention is drawn to the work which has been inaugurated under a branch of the Workers' Educational Association. The purpose and character of this work, which is very important for a Province which is growing so rapidly in its industrial centres, is well set forth in the attached memorandum.

5. A short course intended primarily for members of Farmers' Clubs. This course begins during the present session, but will probably be much developed in the future.

Social Service; Course for Graduate Nurses.—A memorandum is submitted outlining the work of this comparatively new department. Also this winter a course has been established to provide special training for graduate nurses who will undertake duties in connection with the Red Cross Society for the improvement of national health. The expense is borne by the Society.

Ontario College of Education.—By reason of the changes that have been introduced in the organization of what was the Faculty of Education it is now possible for the Ontario College of Education to modify to some extent the character of its work. Hereafter those who enter this college will be required to be graduates in Arts (with the exception of some in special courses), and reduced numbers, together with the better quality of the student, will make possible a more thorough training of the teachers in the higher positions. Also, graduate work will be developed, and it is hoped that a centre will be created within the University such as hitherto has only been found in some of the larger universities of the United States. The additional needs of this college are summarized in the Report submitted by the Dean. They are, briefly: A new building for Gymnasium, Assembly Hall and Library, and more class-room accommodation. Also some additional instructors and graduate scholarships. Before long a residence should be provided for the students of this college.

Future Developments.—The University finances being what they are, it is very difficult at present to consider seriously the addition of responsibilities in the way of development of new departments or faculties, but unquestionably the progress of the community will demand from time to time that attempts shall be made to meet the more urgent requirements.

Salaries.—The welfare and progress of the University are vitally dependent upon the scale of salaries which the resources at the disposal of the Governors allow them to adopt, because unless they are kept at the prevailing level of the universities of a similar grade the staff will, over a period of years, deteriorate. The number of highly productive scholars and scientists who create the atmosphere of an institution inspire students and call out their best powers is comparatively small, and the best men receive attractive offers from other universities, as well as from industrial and business concerns. Also, unless young men have fair prospects for a comfortable livelihood there will be a diminishing supply of our ablest and best for academic work. It would be delusive for the University to rely solely on idealism. Its quality will not survive long under hard conditions which the people of the country have it in their power to remedy. Moreover, as has been well said by Dr. Howell, of Johns Hopkins University, idealism is not always accompanied by high intellectual gifts, and alone it will not prove sufficient to solve the scientific problems upon the determination of which so much of the improvement of our human lot is contingent. Reasonable salaries must also be given to skilled technicians, librarians and the general administrative staff, without whose faithful service the best results of the teaching staff cannot be obtained.

Estimated Expenditure.—As a result of the survey of the present position and the immediate needs of the University the following estimate may be made, including capital and the increased annual expenditure which may be anticipated as being necessary before the close of another decade.

I. Amount required on capital account for the erection of buildings, most of which should be proceeded with at once (see memorandum):

- (1) For the University itself \$4,150,000

It is not necessary that the payment of this amount should be made within a few years by provincial grants; it may be met over a long period by a process of amortization. To extinguish the debt in forty years, \$3.73849 paid semi-annually for forty years is the equivalent of \$100 now, money being worth 7 per cent. per annum.

- (2) For the College of Education 300,000

II. Increase in expenditure for Maintenance of the University.

Annual expenditures for emergent needs will rise rapidly unless the life of the University is to be injured. While it is hazardous to conjecture, it may be anticipated that with very moderate additions to the attendance expenditures will grow during the next ten years, until at the end of that period the annual increase over the estimates of the present year will reach at least \$1,000,000, or in all a total annual outlay for general maintenance amounting to at least \$3,000,000.

The facts upon which this estimate is made are:

- (a) Maintenance of new Buildings (\$4,000,000) and administration, at 7½ per cent. \$300,000
 General increase in Administration and other departments 100,000
 Additional for Research 125,000
 " " Arts 100,000
 " " Medicine 125,000
 " " Applied Science 150,000
 " " Forestry 13,000
 " " Library 75,000
 " " Extension 50,000

(b) The proposal to aim at an addition to the annual budget of the University of \$1,000,000 in the next ten years, in addition to over \$4,000,000 required very soon for buildings, will not appear unreasonable when it is borne in mind that in 1905-6, when the Governors took office, the expenditure was \$456,398; in 1910 it was \$775,000; in 1915-16 it was \$949,630, and in the present year it is estimated at nearly \$2,000,000. The increase from the year of the outbreak of the war to the present is more apparent than real when the depreciation of the value of the dollar is taken into account. In the ten years following 1905-6 there was an increase of about \$500,000. Should the development of the University during the next ten years continue proportionately with what it was in the ten years preceding the war, and should the value of the dollar remain as it is at present, the addition of a million dollars would be no actual increase in the scale of expenditure over that of the first ten years under the present Board of Governors.

(c) Moreover, this expectation is supported by the accompanying figures from American Universities. Every one of the five great State Universities, together with Harvard and Pennsylvania, has at present a much larger budget than the sum proposed for Toronto within ten years.

	1901	1910	1918	1920-21
Michigan	\$500,000	1,177,425	2,552,800*	3,819,000*
Wisconsin	400,000	1,755,000	2,598,287*	4,462,085*
Illinois	450,000	1,639,792	2,825,409*	3,352,785*
Minnesota	350,000	813,784	2,678,453*	5,059,591
California	500,000	1,625,000	3,486,625*	4,432,282*
Harvard . . . . .	.....	.....	.....	4,157,315*
Yale . . . . .	.....	.....	.....	2,667,518 (1918-19)
Pennsylvania . . . . .	.....	.....	.....	3,269,552*
Toronto	233,283 (1902)	777,800	1,191,602*	1,993,000* (estimate)

Nor can the difference in expenditure between those Universities and Toronto be explained by the large numbers of students in attendance there, because the expensive Faculties are Arts, Medicine and Applied Science, and very few American Universities have an attendance in these faculties much in excess of that of Toronto. The real explanation is that Toronto has been conducted on a scale of expenditure which has been too small to permit of the development which has already been attained by the leading Universities of the United States. There can be no question, indeed, as to the present status of our undergraduate degrees in Arts and in the professional schools. They hold their own with any on the continent, but this will not continue long unless advancement is made now, and in the matter of graduate work and research Toronto has a long way to make up on its neighbours. It may not be out of place to quote a sentence written some years ago by Dr. Pritchett, of the Carnegie Foundation for the Advancement of Teaching: "No such movement of the youth toward the institutions of learning has been seen since the great migrations of students to the universities of the Middle Ages. The university is becoming each decade a more powerful factor in civilization. The enormous increase in student attendance is throwing upon the strongest and most conscientiously conducted colleges and universities a burden and a responsibility that will tax their resources and their educational wisdom to the utmost. The country has grown accustomed to think in millions in the organization and conduct of business; it still thinks in thousands in the organization and conduct of universities, and yet the problem of the university in America has enlarged even more rapidly than the problem of business. The country is calling upon the university for an unprecedented service to civilization. How shall we find the money and the teachers to answer the demand?"

The success of the University makes possible the intellectual, spiritual, social and economic progress of the Province. From it come the teachers of the highest grades, clergymen, leaders in public life, lawyers, journalists, medical men who promote the health of the whole community, engineers and foresters who develop our natural resources, investigators who through their researches discover processes that lead to industrial and agricultural wealth. Not only so; the development of the University will inevitably improve education from the top to the lowest grade of school. A Province cannot possess a first-class university without soon finding keen intellectual vigour coursing through its whole system. It is this fact that has made the people of the American States so enthusiastic in the support of their State universities, for they know by experience that the general welfare of the public who do not come near them is affected by their efficiency. Our people are not less eager for education than the Americans, as is proved by our schools and by the large proportion of our youth who enter upon a university career, and they are sufficiently intelligent to be willing to make sacrifices equal to those of our neighbours for the support of a great provincial university in which their sons and daughters can find the best instructors, and so will not be driven by their desire for knowledge to emigrate to a foreign country.

The University of Toronto, as the range and quality of its work become more generally known to the people of the Province, is bound to appeal to their imagination. It stands among the best of the continent. Its progress must not be impeded. In war its students, graduates and staff accomplished magnificent things; in peace they will prove themselves equally forward in the promotion of the intelligence and high endeavour that constitute the greatness of a people, and in diffusing such conceptions of truth and conduct as will make us worthy to be a leading nation in western civilization.

*Exclusive of buildings.

OCCUPATIONS OF THE FATHERS OF STUDENTS APPLYING FOR ADMISSION TO THE UNIVERSITY
IN THE SESSION 1919-1920.

	Arts.	Medicine.	Applied Science.	Forestry.	Total.
Dentistry	6	1	2	1	10
Engineering	9	6	21	..	36
Finance	62	30	30	2	124
Journalism	12	3	2	..	17
Law	29	7	3	1	40
Medicine	27	41	11	2	81
Pharmacy	8	7	2	..	17
Teaching	27	14	18	3	62
The Clergy	61	27	26	2	116
Library	2	..	..	..	2
Veterinary	1	3	..	..	4
Art	2	2	1	..	5
Merchants: Wholesale	56	21	27	2	106
" Retail	104	61	50	3	218
Manufacturers	59	19	28	..	106
Artisans	60	36	47	1	144
Railway Employees	32	10	13	1	56
Dominion Officials	16	16	8	1	41
Provincial Officials	3	2	9	..	14
Municipal Officials	10	3	7	1	21
Farmers	172	99	79	1	351
Lumbermen	2	5	6	..	13
Soldiers	4	1	2	1	8
Fishermen	1	..	..	..	1
Not specified	120	54	59	7	240
	<hr/> 885	<hr/> 468	<hr/> 451	<hr/> 29	<hr/> 1,833

The students from the Province of Ontario are distributed as follows:

County	Faculty of Arts	Graduate Studies	Faculty of Medicine	Faculty of Applied Science	Faculty of Education	Faculty of Forestry	Faculty of Music	Department of Social Service	Returned Soldiers' Matric. Class	Totals
Algoma	13		4	3				2	2	24
Brant	39		19	19	8			2	3	90
Bruce	28	2	23	15	12			9	7	96
Carleton	57	3	20	11	6	3		3	5	108
Dufferin	7		9	3	2			3	2	26
Dundas	12	1	3	2	4	1		1		24
Durham	8	1	11	5	8			6	2	41
Elgin	17	1	16	9	6		1	6		56
Essex	32		21	7	6			1	1	68
Frontenac	3		8		1		1	1		14
Glengarry	3	1	4					1		9
Grenville	5	1	3	5	2					14
Grey	30	3	29	17	9			4	1	93
Haldimand	16	1	13	8	8			2	1	49
Halton	20	3	10	9	4		1	6	4	57
Hastings	19	1	17	6	1			1		45
Huron	51	4	20	17	28	1		2	2	125
Kenora	2		5	1						8
Kent	21		23	7	6		1			58
Lambton	21		24	11	5	1		5		67
Lanark	15	2	10	6	7	2		4		46
Leeds	21	1	15	3	4	1		3		48
Lennox and Addington	11	1	7	1	1			1		22
Lincoln	20	3	19	8	7			6	1	64
Manitoulin	1		4							5
Middlesex	44	6	13	24	24			8	2	121
Muskoka	3		3	5		1		2		14
Nipissing	8		4	5	2			1	3	23
Norfolk	10	2	6	9	3			4	2	36
Northumberland	20		9	2	4			3	1	39
Ontario	41	5	22	25	7			8	4	112
Oxford	27	2	28	11	8			3		79
Parry Sound	3		6	2				1		12
Peel	31	1	17	12	5	2		4		72
Perth	51		37	20	20	1	1	3	2	135
Peterborough	34	1	10	5	4			10	2	66
Prescott	1			1	2					4
Prince Edward	4		4	2	4					14
Renfrew	17		4	2	1	1		1	1	27
Russell	1		3		2					6
Simcoe	68	4	48	27	20		1	9	12	189
Stormont	6		3	1	3					13
Sudbury	3		4	2		1				10
Thunder Bay	6		3	2	1			1	2	15
Temiskaming	4		2	3					2	11
Victoria	15	3	15	12	10			1		56
Waterloo	22	1	16	28	8			6		81
Welland	21	1	25	13	2			2		64
Wellington	53	7	46	9	17	1		8	1	142
Wentworth	77	3	15	33	26	1	1	10	3	169
York	62	1	36	45	12	2		14	10	182
Toronto	693	80	412	299	84	18	11	151	80	1,828
Totals	1,797	146	1,128	770	404	37	18	319	158	4,777

BUILDING REQUIREMENTS.

I

1. Heating Plant	\$300,000	
2. Anatomical Building	600,000	
3. Forestry and Botany Building	300,000	
4. University College Extension	300,000	
5. Administration Building (probably including completion of Convocation Hall)	400,000	
6. Women's Building (Gymnasium, etc.)	250,000	
		<hr/> \$2,150,000

II

7. Union and Residence for University College Women	\$450,000	
8. Residence for University College Men	450,000	
9. Part of South Wing, Museum (to relieve Applied Science by re- moving Mineralogy and Geology)	250,000	
10. Medical Building at Hospital	300,000	
11. New Wing, Chemical Building	250,000	
12. Addition to Library	300,000	
		<hr/> 2,000,000
		<hr/> \$4,150,000

III

Extensions for College of Education	\$300,000
---	-----------

1. *Heating Plant.*—The Heating Plant must be extended as soon as any additions are made to the buildings of the University. The present plant is now bearing a load almost heavier than should be put upon it.

A new plant should be erected probably north of Hoskin Avenue in order to serve the buildings on that part of the University grounds together with Victoria College, the Royal Ontario Museum and Trinity College. This would relieve the present plan sufficiently to enable it to carry the load when new buildings are erected south of Hoskin Avenue.

2. *Anatomy Building.*—Under the former Government authorization was given to proceed with the erection of a building for Anatomy. As far back as 1908 the need for such a building was presented to the Board of Governors. The condition of the Anatomy Department is being seriously jeopardized by any delay.

3. *Forestry and Botany Building.*—These departments are at present housed in an old residence to which temporary additions have been made under pressure of accommodation for students from time to time. Instruction is given in sixteen courses in Forestry and twenty-six courses in Botany, exclusive of graduate work. In 1919-20 forty-eight were registered in Forestry; and 645 were taking lectures and 303 taking laboratory work in Botany, from the Faculties of Arts (including Household Science), Applied Science, Forestry and Veterinary Science. In addition there were seventeen graduate students from nine Canadian Universities and Colleges. The condition of affairs is so serious that a special memorandum is submitted dealing with the needs of the Forestry and Botany Departments.

4. *University College Extension.*—The extension of the Main Building, by completing the quadrangle on the North side, would give University College immediate relief in the way of very greatly needed modern class-rooms and private rooms for the professors and instructors. If the Administration also were removed from the Main Building it might be possible to accommodate probably for the next ten years the non-laboratory university subjects, such as Economics, History, Philosophy, Mathematics, and Italian and Spanish. A special memorandum is submitted from the Department of Political Science setting forth the utter inadequacy of the present quarters in what was a private residence, 71 St. George St.

5. *Administration Building.*—The administration of this University is now so hampered by lack of adequate accommodation that the welfare of the University itself is beginning to suffer. Necessary developments cannot be undertaken unless more room is provided for various offices. The registration of students cannot be carried out, the effectiveness of the Registrar's and other offices is interfered with, and the Extension Department will be handicapped unless a new building is soon provided. It is suggested that this building might be erected at the West of Convocation Hall, the completion of the Hall being at the same time carried out.

6. *Women's Building.*—A women's building, which will be used chiefly for the physical training of the women of the University, is urgently needed. It will provide gymnasium and swimming facilities, together with common rooms for the general activities of all the women of the University, such as are provided for the men in the north section of Hart House. This building should probably be placed on the north side of Hoskin Avenue, where it will be centrally situated. Already the Governors have set aside \$125,000 for the erection of this building.

The need for the erection of the foregoing buildings is so immediately urgent that construction should be begun upon them at once. The necessity for the following is hardly less pressing:

7. *Union and Residence for University College Women.*—The Union for University College women is now so crowded that its usefulness is being seriously interfered with. Already a committee of the women graduates of University College and friends have inaugurated a plan for raising funds to help in the erection of a new Union on the corner of Hoskin Avenue and St. George Street. Residences for women should be attached to this, and should be extended South on St. George Street as opportunity permits.

8. *Residences for University College Men.*—University College, with its attendance of several hundreds of men from outside the city, has no special residence accommodation. If it is to retain its identity and spirit in competition with the other colleges such a residence is a necessity.

Unlike other university buildings residences for men and women are self-sustaining when once erected.

9. *Removal of Geology and Mineralogy to Royal Ontario Museum.*—The removal of the Departments of Geology and Mineralogy to a wing to be erected in extension of the south side of the Royal Ontario Museum will not only bring these departments into more immediate contact with their great collections in the Museum, but also will release space in the Chemistry and Mining Building on College Street which can be used for the pressing needs of Chemical Engineering and other departments in the Faculty of Applied Science.

10. *Medical Building at Hospital.*—In order to meet the necessary expansion in the clinical departments of the Faculty of Medicine, namely, Medicine, Surgery, Gynaecology and Obstetrics, a new building for laboratories should be erected in extension of the present Pathological Building on university property at the South-west corner of the grounds of the Toronto General Hospital. The Department of Pharmacy and Pharmacology would probably be transferred to this building. The gift made by the Rockefeller Foundation for the development of the Faculty of Medicine renders urgent the erection of this building.

11. *Chemical Building.*—Though at present the Chemical Building, which is used by Arts and Medicine, is sufficient to meet immediate needs, extension will be required before long.

12. *Library.*—In the present Library building the stack-room accommodation is exhausted, and when the shelves will have been filled within a short time addition to the stack-room will become necessary.

Ontario College of Education—

(1) Five rooms for Household Science course, one additional room for the Art course, three additional rooms for the High School Assistants' course.

(2) Gymnasium, Assembly Hall and Educational Library.

(3) A Kindergarten and two class-rooms (Grades I and II).

ENDOWMENT, INCOME, EXPENDITURE, REGISTRATION.

(a) The amount and nature of the University endowment is as follows:

1. Site Lands, Buildings and Contents:

(a) The University site lands, valued mainly on a basis of 40 cents per superficial foot (with some later items at cost price)	\$1,294,726 00
(b) The various University buildings valued approximately at cost	3,580,306 52
(c) The library, apparatus and other departmental equipment, furniture, etc.	549,146 42
(d) The Central Power Plant	397,898 50
(e) The Connaught Laboratories	75,000 00

\$5,897,077 44

2. Unproductive Lands, consisting principally of the remainder of the old Upper Canada College block, 103 feet on King Street, carried in the books at \$50,000, but probably may realize more if a sale can be effected; also a few lots in Port Hope and other townships	57,067 42
3. Leased Properties, including the Queen's Park lands	637,734 53
4. Investments, Cash and Accounts Receivable	930,878 69
5. Superintendent's Stores	13,297 36
	<hr/> \$7,536,055 44

From this total there require to be deducted the following liabilities and trust funds:

(a) Liabilities (present value) under Annuity debentures issued to provide funds for buildings	927,562 44
(b) Scholarship and other Trust Funds	347,742 53
(c) Retirement Fund accumulations	30,192 56
(d) Equipment Funds (University Press, Connaught Laboratories and Organ Fund)	115,377 96
(e) Contingent Funds, etc.	4,768 29
	<hr/> 1,425,643 78

Leaving the General Endowment as (30th June, 1920)\$6,110,411 66

(b) The various sources of revenue are the following:

Legislative and Government Grants,
Investment and Land Income,
Fees of Students, University and University College,
Residence Dues,
Central Power Plant Receipts,
Casual Items.

The receipts under these heads in 1919-20 were:

Legislative Grant, University Act, 1906	\$500,000 00
Legislative Grant, 60 Vict., Cap. 59	7,000 00
Grant by Provincial Government on account of Faculty of Education	15,000 00
Grant by Provincial Government for Special Course in Household Science	5,400 00
Investment and Land Income	62,508 00
Fees, University and University College	382,559 00
Men's Residences	15,211 00
Women's Residences	24,159 00
Women's Union	17,491 00
Central Power Plant	34,821 00
Casual Revenue	4,371 00
	<hr/> \$1,068,520 00

Deduct interest written to Scholarship and other accounts	12,695 00
	<hr/> \$1,055,825 00

The fees per student in the different Faculties range from \$10.00 to \$150.00, according to the subject or course taken.

(c) The cost of the various Faculties and Departments of the University, including Administration, for the year 1919-20, is shown in the attached table.

REVENUE EXPENDITURES, 1919-20.

	Appropriation	Supplementary	Unused	Total
I. Administration:				
1. Salaries	\$94,300 00	\$525 86		\$94,825 86
2. Pensions and Ret. Allowances	15,050 00	400 00		15,450 00
3. President's Office	350 00	23 00		373 00
4. Bursar's Office	2,200 00	4,570 21		6,770 21
5. Registrar's Office	4,650 00	406 00		5,056 00
6. Superintendent's Office	750 00	1,232 71		1,982 71
7. Library	50,900 00		17,124 03	33,775 97
8. Gymnasium and Students' Union, Hart House	8,200 00		248 68	7,951 32
9. Convocation Hall	2,525 00		51 39	2,473 61
10. Grounds	14,600 00	2,889 84		17,489 84
11. Examinations	12,250 00	5,455 78		17,705 78
12. Convocation Expenses	1,000 00	1,603 76		2,603 76
13. Receptions to Societies	1,000 00	27 38		1,027 38
14. Telephones	3,800 00	1,342 01		5,142 01
15. Insurance	9,000 00	865 06		9,865 06
16. Advertising Expenses	1,300 00		380 85	919 15
17. Aid to Publications and Societies	1,350 00		450 00	900 00
18. University Studies	3,000 00	755 67		3,755 67
19. Law Costs	500 00	640 37		1,140 37
20. Travelling Expenses	1,650 00		445 72	1,204 28
21. Senate Elections	1,200 00		557 20	642 80
22. Roll of Service	2,700 00		566 42	2,133 58
23. Alumni Association	5,200 00	100 00		5,300 00
	\$237,475 00	\$20,837 65	\$19,824 29	\$238,488 36
II. Faculty of Arts:				
24. Salaries	\$370,022 00	\$4,512 08		\$374,534 08
25. Retiring Allowances				
26. Main Building	11,700 00	7,411 75		19,111 75
27. Biological Building and Department	9,635 00	1,784 92		11,419 92
28. Sub-Department of Botany	4,650 00	2,141 07		6,791 07
29. Biochemistry Department	5,500 00	635 58		6,135 58
30. Physiology Department	3,200 00	67 30		3,267 30
31. Chemical Building and Department	10,775 00	1,903 88		12,678 88
32. Sub-Department of Physical Chemistry	500 00	80 27		580 27
33. Physics Building and Department	11,700 00	2 697 35		14,397 35
34. Sub-Department of Astrophysics	850 00		47 59	802 41
35. Geological Department	400 00	457 29		857 29
36. Mineralogical Department	1,000 00		577 88	422 12
37. Philosophical and Psychological Dept.	550 00	215 36		765 36
38. Mathematical Department	30 00		10 75	19 25
39. Sub-Dept. of Mechanics	400 00		235 83	164 17
40. Political Science Building and Department	2,650 00		804 78	1,845 22
41. History	75 00		19 18	55 82
42. Italian and Spanish	25 00	10		25 10
43. University College Depts.	420 00		224 60	195 40
44. University College General Expenses	350 00		196 20	153 80
45. Trinity College Service	525 00	328 84		853 84
	\$434,957 00	\$22,235 79	\$2,116 81	\$455,075 98

	Appropriation	Supplementary	Unused	Total
III. Faculty of Medicine:				
46. Salaries	\$87,060 00		\$16,381 34	\$70,678 66
47. Retiring Allowances				
48. Anatomy	2,750 00		371 84	2,378 16
49. Pathology and Bacteriology	2,260 00	175 57		2,435 57
50. Chemical Pathology	1,500 00		70 34	1,429 66
51. Pharmacy and Pharmacology	650 00	224 43		874 43
52. Medicine		13,000 00		13,000 00
53. Ditto, Maintenance of Building, 1 Queen's Park.....		1,084 56		1,084 56
54. Surgery	450 00		147 09	302 91
55. Obstetrics and Gynaecology	300 00		190 33	109 67
56. Ophthalmology	100 00		100 00	
57. Oto-Laryngology	200 00	58 84		258 84
58. Therapeutics	100 00	49		100 49
59. Hygiene	2,600 00		296 91	2,303 09
60. Medical Jurisprudence				
61. Medical Building	6,025 00	881 70		6,906 70
62. Pathological Building	7,925 00	142 00		8,067 08
63. General Expenses	2,100 00	606 23		2,706 23
64. Summer Session in Medicine	1,500 00		10 00	1,490 00
	\$115,520 00	\$16,173 90	\$17,567 85	\$114,126 05
IV. Faculty of Applied Science:				
65. Salaries	\$147,000 00	\$10,650 55		\$157,650 55
66. Mining (C. & M.) Building	6,350 00	782 63		7,132 63
67. Engineering Building	4,250 00	768 55		5,018 55
68. Old Y.M.C.A. Building		491 72		491 72
69. Thermodynamics Building	1,925 00		\$59 84	1,865 16
70. Geodetic Observatory Bldg.	440 00		77 57	362 43
71. Electrical Engineering	4,650 00		60 99	4,589 01
72. Mechanical Engineering....	2,000 00	314 94		2,314 94
73. Applied Mechanics	800 00	704 21		1,504 21
74. Mining Engineering	1,000 00	663 54		1,663 54
75. Metallurgical Engineering..	1,000 00		122 34	877 66
76. Ferro-Metallurgy				
77. Surveying	11,110 00	317 04		11,427 04
78. Applied Chemistry	3,500 00	934 04		4,443 04
79. Electro-Chemistry	1,750 00	382 36		2,132 36
80. Architecture and Drawing..	800 00	1,149 00		1,949 00
81. Engineering Physics and Photography	1,850 00		859 76	990 24
82. General Expenses	1,200 00	1,634 09		2,834 09
	\$189,625 00	\$18,801 67	\$1,180 50	\$207,246 17
V. Faculty of Household Science:				
83. Salaries	\$14,200 00		\$200 00	\$14,000 00
84. Household Science Building and Department	8,200 00	\$425 21		8,625 21
	\$22,400 00	\$425 21	\$200 00	\$22,625 21
VI. Faculty of Education:				
85. Salaries	\$89,740 00		\$1,205 67	\$88,534 33
86. Education Building and Department	22,600 00		53 64	22,546 36
	\$112,340 00		\$1,259 31	\$111,080 69
VII. Faculty of Forestry:				
87. Salaries	\$12,250 00		\$1,000 00	\$11,250 00
88. Forestry Building and Dept.	4,250 00		236 89	4,013 11
	\$16,500 00		\$1,236 89	\$15,263 11
VIII. 89. Faculty of Music	\$2,000 00		\$231 35	\$1,768 65

IX. University Extension and Social Service:

90. University Extension	\$10,000 00		\$1,101 94	\$8,898 06
91. Social Service Building and Department	6,950 00	\$1,270 00		8,220 20
	\$16,950 00	\$1,270 00	\$1,101 94	\$17,118 26

X. Residences and Dining Hall:

92. Men's Residences	\$7,650 00		\$456 59	\$7,193 41
93. Women's Residences	29,600 00	\$2,285 54		31,885 54
94. Dining Hall		4,179 23		4,179 23
95. University College Women's Union	17,052 00	3,519 56		20,571 56
	\$54,302 00	\$9,984 33	\$456 59	\$63,829 74

XI. 96. Royal Ontario Museum	\$20,000 00	\$2,473 49		\$22,473 49
-----------------------------------	-------------	------------	--	-------------

XII. 97 Central Light, Heat and Power Plant	\$83 600 00	\$1,080 95		\$84,680 95
--	-------------	------------	--	-------------

XIII. 98. Contingencies and Miscel- laneous	\$5,000 00	\$5,699 31		\$10,699 31
--	------------	------------	--	-------------

XIV. 99. Capital Account Charges...	\$75,688 00		\$88 46	\$75,599 54
-------------------------------------	-------------	--	---------	-------------

XV. 100. Special Research	\$75,000 00		\$16,632 42	\$58,367 58
---------------------------------	-------------	--	-------------	-------------

XVI. 101. Special Courses for Re- turned Soldiers	\$5,000 00	\$5,868 33		\$10,868 33
--	------------	------------	--	-------------

RECAPITULATION.

	Appropriation	Supplementary	Unused	Total
I. Administration	\$237,475 00	\$20,837 65	\$19,824 29	\$238,488 36
II. Faculty of Arts	434,957 00	22,235 79	2,116 81	455,075 98
III. Faculty of Medicine	115,520 00	16,173 90	17,567 85	114,126 05
IV. Faculty of Applied Science	189,625 00	18,801 67	1,180 50	207,246 17
V. Faculty of Household Science..	22,400 00	425 21	200 00	22,625 21
VI. Faculty of Education	112,340 00		1,259 31	111,080 69
VII. Faculty of Forestry	16,500 00		1,236 89	15,263 11
VIII. Faculty of Music	2,000 00		231 35	1,768 65
IX. University Extension and Social Service	16,950 00	1,270 20	1,101 94	17,118 26
X. Residences and Dining Hall..	54,302 00	9,984 33	456 59	63,829 74
XI. Royal Ontario Museum	20,000 00	2,473 49		22,473 49
XII. Central Light, Heat and Power Plant	83,600 00	1,080 95		84,680 95
XIII. Contingencies and Miscellaneous	5,000 00	5,699 31		10,699 31
XIV. Capital Account Charges	75,688 00		88 46	75,599 54
XV. Special Research	75,000 00		16,632 42	58,367 58
XVI. Special Courses for Returned Soldiers	5,000 00	5,868 33		10,868 33
	\$1,466,357 00	\$104,850 83	\$61,896 41	\$1,509,311 42

(d) REVENUES AND EXPENDITURES.

	Provincial Grant Under Act of 1906	Percentage of Total Income	Fees	Percentage of Total Income	Provincial Grant For Faculty of Education	Income from Dining Hall and Residen- ces	Total Revenue
1906-07.....	\$213,258	= 47%	\$184,211	= 40%			\$456,398
1907-08.....	357,444	= 56%	213,219	= 33%	\$15,000		642,108
1908-09.....	422,232	= 57%	224,405	= 30%	15,000	\$26,578	741,155
1909-10.....	500,000	= 59%	237,938	= 28%	15,000	35,712	840,307
1910-11.....	459,503	= 55%	263,907	= 31%	15,000	41,173	836,039
1911-12.....	448,325	= 52%	264,895	= 31%	15,000	55,717	854,594
1912-13.....	423,070	= 51%	269,754	= 33%	15,000	59,222	828,788
1913-14.....	435,667	= 51%	274,938	= 32%	15,000	62,078	845,340
1914-15.....	488,725	= 54%	269,836	= 30%	15,000	68,024	905,049
1915-16.....	500,000	= 58%	215,312	= 25%	15,000	59,252	856,870
1916-17.....	500,000	= 58%	188,425	= 22%	15,000	70,292*	854,753
1917-18.....	500,000	= 55%	185,573	= 20%	15,000	105,102*	909,467
1918-19.....	500,000	= 50%	235,901	= 24%	15,000	133,433*	984,734
1919-20.....	500,000	= 47%	382,559	= 36%	15,000	56,860	1,055,825

	Capital Residences Account and Charges	Dining Hall and	Total Expenditure	Surpluses	Deficits	Amount from Succession Duties that would have been received
1906-07.....			\$411,696	\$44,701		—
1907-08.....			613,344	28,763		—
1908-09.....		\$34,223	679,867	61,287		—
1909-10.....	\$25,260	33,755	752,183	88,124		—
1910-11.....	36,122	35,303	777,810	58,229		—
1911-12.....	54,132	47,141	875,849		\$21,255	—
1912-13.....	63,405	50,584	912,995		84,207	—
1913-14.....	65,930	53,595	931,452		86,112	—
1914-15.....	67,193	59,432	949,630		44,621	—
1915-16.....	71,668	52,636	912,359		55,489	\$510,282
1916-17.....	74,418	62,966*	946,447		91,694	690,799
1917-18.....	75,995	94,700*	1,076,225		166,758	1,008,122
1918-19.....	75,585	115,525*	1,191,602		206,869	1,208,647
1919-20.....	75,600	63,830	1,509,311		453,486	1,452,989

\$4,870,839

Disposition of accumulated surpluses to 1911:

Returned to Capital account, amount borrowed <i>re</i>	
Physics building	\$118,945 85
Extras on Thermodynamics building	12,720 65
Separation of accumulated surplus fees in Music towards Organ Fund	7,172 62

(Balance applied on deficits) \$138,839 13

Deficits as above	\$1,211,578 68
Less balance from surpluses (\$281,106.87-\$138,839.13)	142,267 74
	<u>\$1,069,310 94</u>

*Note.—Military in occupation of Dining Hall and Men's Residences during portion of 1916-17 and 1918-19, and whole of 1917-18.

Special Government Grants:

1913-14	\$80,000 00
1915-16	80,000 00
1916-17	100,000 00
1917-18	200,000 00
1918-19	200,000 00
1919-20	400,000 00
	<hr/>
	\$1,060,000 00

Balance of deficit unmet on 30 June, 1920 \$9,310 94

The University Act, 1906, provided that for the purpose of making provision for the maintenance and support of the University and of University College there should be paid to the Board yearly commencing 1 July, 1906, a sum equal to fifty per cent. (50%) of the average yearly gross receipts of the Province from Succession Duties, the average to be determined by and be based upon the gross receipts from such Duties of the three years ended on the 31st day of December next preceding the day on which the first instalment of the year is to be paid.

This provision was limited by an amendment in 1914 to a maximum of Five hundred thousand dollars (\$500,000) in any year.

Had the above not been modified the University would have received \$1,310,339 additional.

(c) GRANTS FOR BUILDINGS.

The Grants received from the Provincial Government for buildings during the last 15 years have been the following:

(1) Annuity Certificates of \$30,000 per annum for 30 years from 1905. These realized upon sale the sum of \$579,384.21, which was disposed of as follows:—

I. University Buildings:

(a) Towards cost of Convocation Hall and Examination Wing	\$110,914 64
" Physics Building	45,000 00
" Forestry Building and Plant Houses	21,101 65
" Men's Residences and Furnishings	60,238 33
" Women's Residences	30,129 32
Removing Geodetic Observatory to new site	12,000 27
	<hr/>
	\$279,384 21
(b) The Erection of New Electrical Engineering Building, 1920	350,000 00
	<hr/>
	\$629,384 21

II. The Toronto General Hospital:

(a) From above Debentures	\$250,000 00
(b) Special Grant on Capital Account, 1920	125,000 00
	<hr/>
	\$375,000 00

III. The Royal Ontario Museum:

The Government also contributed \$197,973.12 being (approximately) one-half the cost (\$399,970.81) of the erection of the Royal Ontario Museum, the University contributing the remainder including \$50,000 realized from the above debentures.

(f) The values attached to the various University

Buildings are as follows:

Household Science building	\$455,000 00
Main building	450,000 00
Chemistry and Mining, with adjacent building ..	384,736 89
Physics building	363,945 85
Library building	327,425 50
Convocation Hall and Examination Wing	214,866 22
Education building	184,383 47
Education building annex	6,698 63
Pathological building	169,694 38
Medical building	165,000 00
Biological building	129,745 30

Thermodynamics building	\$119,017 21
Chemical building	77,469 88
Engineering building	50,000 00
Electrical Engineering building*	126,304 23
Forestry building	30,101 65
Botanical building	13,000 00
Geodetic Observatory building	12,000 27
Political Science building	11,933 26
Social Service building	7,500 00
Men's Residences	170,000 00
Women's Residences	93,945 83
University College Women's Union	13,521 18
Argyll House	10,450 00
Y.M.C.A. building	1 00
No. 1 Queen's Park (Department of Medicine) ..	6,075 77
	<hr/>
	\$3,592,816 52
Less balances of purchase money yet due on	
Social Service building, 184 College Street,	
and Argyll House	12,510 00
	<hr/>
	\$3,580,306 52

(g) COST PER STUDENT IN EACH FACULTY.

Arts.

It is difficult to arrive at a very close approximation of the cost per student in each Faculty inasmuch as certain departments which serve several Faculties are classed under the Faculty of Arts, but making a deduction for instruction of students of the Faculty of Medicine in the Departments of Physics, Chemistry, Biology, Bio-chemistry and Physiology and for the Faculty of Applied Science in Mathematics and Mechanics, Geology, and Mineralogy, it may be estimated that the expenditure for the Faculty of Arts was in the neighbourhood of \$365,000. The students in attendance in Arts numbered 2,158. The cost per student in Arts would be about \$170.

The cost of individual students in Arts varies much more than in any of the other Faculties because of the variety of courses taken, and the non-laboratory courses are much less expensive than the scientific courses.

No fees are received by the University for tuition in university subjects given to the students of the Federated Universities; on the other hand the Province has not to pay for their instruction in college subjects.

Medicine.

Adding \$80,000 as a deduction from Arts for instruction given to medical students the total expenditure for Medicine in 1919-20 was \$194,000. The number of students in this Faculty was 1,284. The cost per student would be \$150, but assuming that the number will soon fall to 750 and that the expenditure remains the same the cost per student would be about \$260.

Applied Science.

Adding the proportion from Arts to Applied Science for instruction given to Applied Science students the total expenditure was \$216,000. The number of students in this Faculty was 819, and the cost per student would be \$270.

Forestry.

Total expenditure \$15,263; the number of students 50; and the cost per student \$300

Household Science.

There are no regular students as these are included in the Faculty of Arts, and there were only occasional students. By the will of the late Mrs. Massey Treble the interest of \$100,000 has been left for the maintenance of this Faculty.

*In course of construction. Final cost will probably reach \$350,000.

The average cost per student for administration is about \$46. Therefore, the total cost per student without including interest on buildings and land is:

Arts	\$170 +	\$46 =	\$216
Medicine	260 +	46 =	306
Applied Science	270 +	46 =	316

Deduct Fees:

Arts \$50 to \$60.
Medicine \$150.
Applied Science (average \$112).

Deduct 1/14 of residue as income from endowments, etc.:

Arts \$11-12.
Medicine \$11.
Applied Science \$14.50.

Total cost to Province exclusive of interest on buildings and land:

Arts \$145 or \$154.
Medicine \$145.
Applied Science \$189.50.

(h) THE SCALE OF PROFESSIONAL SALARIES ADOPTED BY THE BOARD 27TH MAY, 1920:

Lecturer	\$1,800 to \$2,500
Assistant Professor	2,700 to 3,500
Associate Professor	3,700 to 4,600
Professor	4,800 to 5,500
Some Heads of Departments to go to	6,000

The President to receive a salary of \$10,000 with free house, heat and light.

Present salaries of the following:

The Bursar	\$4,750 + bonus \$500
The Registrar	4,250 + " 750
The Librarian	4,250 + " 750
The Superintendent	4,000 + " 800

(i) SCHEDULE OF REGISTRATION OF STUDENTS, 1899-1920.

Faculty or Department.	1899-00	1904-05	1909-10	1914-15	1919-20	1920-21
Arts—Regular and Occasional	763	1,198	2,149	2,161	1,925	2,024
Summer Session and Teachers' Courses					64	99
¹ Graduate Studies					169	150
Medicine	313	652	641	660	1,284	1,009
² Applied Science and Engineering	193	483	729	563	819	806
Household Science			86	96	....	....
Education			236	412	423	68
Forestry			39	48	48	54
Music					20	11
Social Service				293	335	354
Returned Soldiers' Matriculation Class..					172	
Summer Session (Conducted for Department of Education)			164	243	....
Total (Less duplicate registrations)	1,269	2,333	4,044	4,428	5,237	*4,566

¹ Included in the Faculty of Arts until 1916.

² School of Practical Science until 1903.

*The reduction in this total from the total of 1919-20 is due to the following causes:

1. The removal of non-graduate students (350 approx.) from the Ontario College of Education.
2. The transfer of the teaching of Anatomy to students in Dentistry (200 approx.) from the Faculty of Medicine to the School of Dentistry.
3. The discontinuance of the returned soldiers' Matriculation Class (172).

SCHEDULE OF STAFF, 1899-1920.

<i>Faculty or Department.</i>	1899-00	1904-05	1909-10	1914-15	1919-20	1920-21
Arts—University and University College	50	87	136	146	182	186
Victoria College	14	14	20	24	23	25
Trinity College .....	...	19	14	21	18	15
St. Michael's College .....	...	...	11	9	22	22
Medicine	40	96	124	145	189	197
Applied Science	14	27	67	73	73	79
Household Science .....	...	...	9	8	11	9
Education .....	...	...	46	26	32	29
Forestry .....	...	...	2	2	4	3
Music .....	...	...	...	...	...	5
Social Service .....	...	...	...	...	14	3
	118	243	429	454	568	*573

BENEFACTIONS TO THE UNIVERSITY OF TORONTO.

It is often said that a University supported by the Government does not receive large benefactions from private donors. This is emphatically not the case with the University of Toronto as is evident from the following gifts which have been received during the past fourteen years.

Two of the three men's residences were given, one by E. C. Whitney, Esq., and Mrs. Whitney, and the other by friends of the University among whom were several of the Governors; each of these buildings cost \$50,000.

The Household Science Building, which at the time of its erection must have cost nearly \$500,000, was given by Mrs. Massey Treble and opened in 1912, and in her will there was a legacy of the interest on \$100,000 for the maintenance and development of this Department.

In 1917 the Connaught Antitoxin laboratories, together with a farm of fifty-eight acres, the cost of which amounted to at least \$75,000, were given by Col. A. E. Gooderham, a Governor of the University. Also during the years 1918-19 and 1919-20, Col. Gooderham provided a laboratory with equipment for the Research Department of Zymology.

Of all the gifts to the University the most magnificent is the Hart House, which has been designed and constructed on such a scale as to make it a unique building for its especial purpose among those of the universities of the world. It is probably one of the most munificent individual gifts that has been made to any university on this continent. While the Governors have not been informed as to the cost of the structure, furnishing and equipment, it is probable that it should be estimated at not less than \$1,500,000.

Sir John Eaton, a Governor of the University, and Lady Eaton have undertaken to give \$25,000 a year for twenty years to maintain the Department of Medicine in the University, a total of \$500,000.

Over a period of five years the sum of nearly \$50,000 was given for research in clinical medicine by five donors, Sir John Eaton, Sir Edmund Osler, Col. R. W. Leonard, J. L. Englehart, Esq., and Dr. Geo. E. Cook, of whom the first three were Governors.

Sir Edmund Osler has for five years given \$1,000 a year for two graduate fellowships and for three years \$1,000 a year for Research in Pathology.

From 1901 until 1919 Sir Joseph Flavell gave an annual post-graduate fellowship of \$750 a year, the amount of the final award being raised to \$1,500. For three years he gave in addition a post-graduate fellowship of \$500.

Col. Leonard has for five years given a post-graduate fellowship of \$500 a year and for one year he paid the salary of a lecturer in Chemical Metallurgy; he also provided the equipment for the Cadet Corps of the University of Toronto Schools.

Mrs. H. D. Warren, in addition to large benefactions to the Museum, and to the University War Memorial Fund, provided a salary of \$3,000 a year for four years for the salary of the Director of the Social Service Department.

Through the advice of the late Mr. Z. A. Lash, one of the Governors of the University, a bequest of \$25,000 was made from the E. C. Walker Estate.

Last year the Alumni Association raised a fund for a War Memorial which already has amounted to nearly \$335,000. To this Sir Edmund Osler and Col. Leonard contributed each \$25,000, and Sir John Eaton \$10,000.

*Figures for the present session are approximate, as certain appointments have still to be made.

In memory of Dr. Richardson, his daughter, Mrs. Freeland, gave \$10,000 to found a fellowship in Anatomy, and an unknown donor has given \$10,000 to found a scholarship connected with the Guelph Collegiate Institute in memory of the late Col. John MacCrae.

By the will of the late Dr. W. J. Mickle, of London, a distinguished graduate of the University of Toronto, a legacy of \$50,000 has accrued to the University to found two Fellowships, to be called respectively the Charles Mickle and the Ellen Mickle Fellowships. The latter of these is to be given to the student highest in Medicine for the purpose of post-graduate research. The former is to be awarded annually by the Faculty of Medicine to that member of the medical profession who will be deemed to have made the most valuable contribution to the science of medicine during the preceding ten years.

The late Mrs. Marfleet, of Illinois, gave \$5,000 to found the Marfleet lectureship in memory of her husband.

The University Base Hospital was splendidly equipped by friends of the University, over \$150,000 having been raised, of which \$40,000 was given by a graduate, A. C. Hardy, Esq., of Brockville, and Mrs. Hardy.

Many other smaller donations have been received, giving evidence of the deep interest taken in the University by members of the Board of Governors, graduates, and citizens generally. Also groups of Alumni in the United States, or belonging to the Faculty of Applied Science, have from time to time contributed graduate fellowships for research work in science.

The Royal Ontario Museum is intimately connected with the University of Toronto which bears one-half of the expense of its maintenance. It is surpassed by only one, or perhaps two, museums on this continent. Its contents, which are of varied and extraordinary interest, have been acquired for the most part through the generosity of citizens of Toronto, several of the chief donors being Governors of the University. It is almost impossible to place a money value on the contents of the different museums, but probably they could not be replaced for several millions of dollars, and in many cases the exhibits are unique.

While the Toronto General Hospital is under the direction of its own Board of Trustees it is very closely associated with the University and is indispensable for the instruction of its students in medicine. Towards the erection of these magnificent buildings \$2,250,000 in private subscriptions have been received, several of the largest subscribers being gentlemen who are on the University Board of Governors.

Since the year 1906 the total amount granted to the University by the Legislature of the Province has been in the neighbourhood of \$7,450,000. During the same period the gifts to the University, apart from the Ontario Museum and the Toronto General Hospital have been, on a moderate estimate, about \$3,400,000. If these two institutions, so closely associated with the University, were included, as much more should be added, with the result that private benefactions direct or indirect have nearly equalled the outlay of the Province.

COMMUNICATIONS FROM VICTORIA AND TRINITY UNIVERSITIES AND ST. MICHAEL'S COLLEGE.

(1) *Victoria University.*

PRESIDENT FALCONER,
University of Toronto,

Victoria College,
Toronto,
Dec. 1st, 1920.

In the matters which are now before the University Commission, recently appointed, I desire to lay before you the interests of Victoria College.

Victoria University entered into Federation with the University of Toronto because Toronto University was the property and care of the people of the Province of Ontario. The debates and correspondence in the press in connection with the action then taken by the Methodist Church bring out clearly two considerations which appeared to justify Federation and the action of Victoria with reference to the same. In the first place it was felt that if Victoria, and other Universities, would accept the conditions of Federation and move to Toronto, the way would be open for the first time for the people of this Province to build up one great, strong, adequately equipped University. Distracting counter interests created by the Church Universities would disappear, and the Legislature of the Province would be free to make all needed money grants with a generous hand. The second reason, of course, was that Victoria College believed that it would be to the advantage of her own students to share in the advantages and prestige of such a great Provincial University as would thus be created in the course of time. It did not occur to the friends of Victoria at that time, or if it did it was dismissed as too great an improbability, that the time would come when her students would find them-

selves handicapped in the University by reason of inadequate provision for the proper maintenance of the University. She came in to share not the poverty (she had enough of that of her own) but the prestige of a great and distinguished University. It cost Victoria very much, not in money, but in that University sentiment and pride which the long years of her history had created for her. She has a right to feel aggrieved, and deeply aggrieved, when University classes in which her students share, are altogether too large for efficient teaching.

To Victoria, Federation is a compact. She has tried to fulfil all her obligations. I think, if inquiry were made, it would be discovered that her income from her endowments and from the givings of the Methodist people year by year, is larger than any similar income in any University outside of Toronto, receiving aid from the Government of Ontario. She has done her part, not only in maintaining, but in elevating the standard of education in the University. To educate her students in the subjects assigned to the College, she is spending to-day more money per student than does the University of Toronto in University College. Surely in these premises Victoria College has a right to expect that Toronto University will receive from the Government of this Province all the money needed to make it the great and splendid University which the advocates of Federation in the Methodist Church and in Toronto University circles, predicted would surely come, and which was the hope and dream of all those who had anything to do in advancing the cause of Federation of the Universities of the Churches with the University of the State.

I cannot refrain from referring to another matter. The great and splendid gifts which in recent years have been made to the University, have come very largely from those sources from which Victoria University has derived her support. It is difficult for me to resist the impression that if Victoria had remained an independent University a very large portion of these gifts would have gone directly to her. The contention of the advocates of Federation that the coming of Victoria to Toronto would be greatly to the advantage of the University of Toronto, has been, I am sure, fully justified. I feel, therefore, that Victoria has a special right to urge upon the Commission that the first duty of this Province in higher education is to adequately and generously support the University of Toronto.

Yours sincerely,

R. P. BOWLES,

President.

(2) *Trinity University.*

SIR ROBERT FALCONER, K.C.M.G.,

President, University of Toronto.

Trinity College,

Toronto, 26th November, 1920.

My Dear Mr. President:

Trinity College, as one of the Federated Universities, desires you to present its claims before the University Commission.

Our chief claim lies in the fact that the Province of Ontario entered into a formal agreement with Trinity College to provide adequately in the University of Toronto for the work Trinity was asked to give up. This undertaking on the part of the Province was entered into in consideration of valuable rights both of a financial and an educational nature surrendered by Trinity College in return therefor; and the agreement remains binding on the Province as long as Trinity College continues in federation with the University of Toronto.

About 1899 and 1900 A.D. the Government of Ontario, through the then Minister of Education and others, appealed to Trinity College to strengthen the position of the Government in relation to the State University—and likewise to strengthen the work of that University also—by bringing within the one Federation Trinity Medical College which was a large and flourishing institution, and the University of Trinity College which was carrying on instruction and examination in the two Faculties of Arts and Divinity, and conducting examinations and conferring degrees in other Faculties also.

The grounds of the appeal then made to Trinity College were mainly as follows:

1. That Higher Education in Ontario would be better served by the strengthening of the University of Toronto which would result from this wider application of the University Federation Act.

2. That this closing up of the ranks would enable the Government to deal justly, and more liberally, with the State University.

3. That besides the advantages which would by Federation accrue to the teaching in the faculty of Arts, medical education also would be greatly benefited by the union of Trinity Medical College and the Toronto College of Medicine to form one Faculty of Medicine in the University of Toronto.

4. That the University of Trinity College also would benefit by pursuing the course thus recommended, inasmuch as it could always rely upon the Government to provide adequate financial support for the University of Toronto, in which the students of Trinity College at that time and in future years would fully participate.

In response to this appeal Trinity College inaugurated and supported amongst its graduates in all parts of the Dominion and elsewhere and amongst the members of the Church of England in Ontario who constitute its chief clientele, a movement which in 1903 and 1904 issued in the union of these two Medical Colleges to form the Faculty of Medicine in the University of Toronto; the establishment of Trinity College as an Arts College of the said University; the surrender by Trinity College of its degree-conferring powers in all Faculties except Divinity, and the conferring upon Trinity College of the status of a University federated with the University of Toronto and entitled to enjoy as long as such status continues all the rights and privileges present and prospective accorded to the Federated Universities by the several University Acts of the Province of Ontario and by the special agreement entered into between the Government of Ontario and the University of Trinity College in 1903 and again in 1906.

Therefore, Trinity College would respectfully submit that the Province of Ontario is under special obligation to it to provide adequately for the University of Toronto, with whose fortunes we joined our own under the circumstances herein stated. Trinity College is more especially concerned in the Faculties of Arts and Medicine, and in those features of the University in which all its constituent elements are alike entitled to participate, such as the Library, the Laboratories, the Class Rooms for University lectures, and facilities for exercise and sports on the part of the students.

The last named item is one in which Trinity College has a special claim to be heard. According to the terms under which the federation of this University with the University of Toronto was originally concluded, Trinity College was entitled to remain within its own ample grounds of thirty acres on Queen Street West and to have University lectures duplicated there for its students; but in 1906 the University Commission of that year urged us very strongly, in the interests of the University and particularly of the Faculty of Arts, to surrender that privilege and move into Queen's Park. This we agreed to do, and are now about to carry out the agreement. In doing so we are obliged to give up excellent and most ample playing fields of our own, and be content henceforth with our share in such facilities for athletics as the University may provide. These facilities, as at present existing, are rapidly becoming seriously overcrowded, and we would urge upon the Government a generous policy in securing sufficient land to meet the ever-growing needs of the students of the University for healthy outdoor exercise.

Another claim which Trinity College wishes to put forward is its right to share in the benefits of the central heating plant of the University for the new College Buildings about to be erected on Hoskin Avenue. Other Colleges and Departments of the University are supplied with heat from this system, and Trinity College would have just cause for complaint if it were discriminated against in this matter. Therefore, the College trusts that the Government will provide the University with sufficient capital to enable it to enlarge its heating plant sufficiently to answer to the many new calls now being made upon it. To do so at this juncture will doubtless prove a profitable investment in the long run, as well as an immediate act of justice.

In conclusion, Trinity College would assure the Commission of its entire loyalty to the University of Toronto, its desire to support and strengthen the University by every means in its power, and its conviction that a future big with vast possibilities, which will accrue to the benefit of the whole Province, lies before the Provincial University, if at this critical period the Province has the foresight and the wisdom to provide in no grudging spirit an adequate, just, and even generous measure of support to this great educational Institution.

I have the honour to be,

My dear Mr. President,

On behalf of Trinity College,

Your obedient servant,

T. C. S. MACKLEM,

Provost.

(3) *St. Michael's College.*

SIR ROBERT FALCONER,
President, University of Toronto.

St. Michael's College,
Toronto,
Superior's Office,
December 2nd, 1920.

DEAR SIR ROBERT:

In view of the coming investigation into university conditions by the Government Commission, I feel it my duty to represent to you that St. Michael's College went into the University under definite assurances from the University and from the Government, and that she would have good reason for complaint if the other parties failed on their part.

It is a fact that federation was a difficult and complex problem. All sections of the Province had to be brought to a willingness to see the Government concentrate its efforts on one Provincial University. The entrance of St. Michael's, as representing a considerable proportion of the population, was no small factor. How important it was from our point of view may be seen from the fact that it was the first Catholic college anywhere to take such a step. We gave up all hope of independent existence. In return the Government was to provide the best for our students in non-college subjects in Arts and the best for our young men and young women in other faculties. In the present impoverished state of University finances the Government does not seem to be doing its part.

I trust that after this investigation the Government's attitude will be more in accord with the spirit of federation.

Yours very truly,

H. CARR,
Superior.

UNIVERSITY COLLEGE, TORONTO.

In reference to the needs of University College which will come up for consideration by the new Commissioners appointed to report on the University and its finances, I beg to present the following as the most urgent and immediate necessities of the College.

(1) Enlarged accommodation for lecture rooms: the surrender this session of a large lecture room (No. 13) to the Bursar's department has rendered this question acute, and it is only by trespassing on the Medical Faculty and its large room that our work in English is carried on at all. We require at the earliest possible date the completion of the quadrangle on the north side, which would provide presumably some six fair-sized lecture rooms and twice as many small private rooms for the staff; who for the most part at present have half of one small room. The needs of the College will ultimately require that it occupy the whole College building, at present largely usurped by the Registrar, Bursar and Superintendent; but the smaller change, the completion of the quadrangle, cannot be deferred.

(2) The University draws a considerable portion of its revenue from the tuition fees of the students of the College; the number of these students must be adversely affected when another resident college is established on the University grounds. The security for the number of University College students and the income thereby received will disappear in a year or two, when Trinity College takes its place on its new site. Residences for University College will become necessary, if the University is to receive anything approaching its present tuition fees. Obviously a residence is desirable on other grounds as well, especially in a University which makes so little provision for its students in this direction; and provided the new residences be large enough to give board and lodging to several hundred students, the difficulties which arose in connection with the very small residence for men in old days and led to its relinquishment, need not be anticipated.

(3) The previous paragraph has been concerned with residences for men; but in a certain sense the women students of University College have more pressing claims for further accommodation than the men; for though Queen's Hall and other houses may give shelter to a larger fraction of the women than the men's residences give in the case of the men, on the other hand the women students have nothing to compare adequately with Hart House. These residences may contain perhaps half the number of women for whom provision should be made, but 85 St. George St., their Union building, cannot begin to hold even this fraction of their number. A new Union for women is urgently needed.

(4) I have not said anything of the serious problems existing to-day in connection with the social activities of University College, and arising solely out of the lack of halls and space sufficient to entertain its thousand and more students; the University School is quite inadequate; Hart House, by the terms of its foundation is not available; but none the less the difficulty is a serious and an increasing difficulty; and such Residences, as I have mentioned, seem the natural solution and almost the only solution. All of which is respectfully submitted for the consideration of the Commissioners.

MAURICE HUTTON,

Principal.

THE UNIVERSITY OF TORONTO LIBRARY.

SUMMARY.

At times of expansion hitherto the needs of the Library have been underestimated. The demands upon it are constantly increasing with new requirements as to affording help to students.

1. The fund for the purchase of books is far too small—now only \$18,000, and actually much below the purchasing power of the annual amount granted before the war. The number of volumes added is not much more than one-third of the lower figures among the leading State Universities. An increase will be necessary if graduate work is to be carried on and undergraduates are to be given larger assistance.

2. Need of building expansion—Reserved reading rooms, private rooms for graduate study, and more seminary rooms with stack-room.

3. Administration staff and accommodation inadequate. Staff only 17. Michigan has 62 with part-time undergraduate service in addition. The staff should be doubled in size.

MEMORANDUM.

In any attempt to foresee and provide for the expansion of the University Library during the next ten or fifteen years, it should be borne in mind that in the past the extent of probable expansion for any similar period has always been underestimated. The building erected in 1892 was outgrown in every respect after fifteen years, although when planned it was supposed to satisfy all possible requirements for at least twenty-five years. The substantial additions made in 1908-09, which doubled the size of the original building, are beginning after twelve years to prove inadequate. The steady growth of the older Faculties of the University and the addition of new ones have multiplied the demands upon Library resources in many unexpected ways, and latterly the establishment of graduate courses of research, leading to higher degrees, has introduced into Library administration a new element not previously reckoned with. Moreover, methods of bringing books to readers and readers to books are constantly being improved by the great University Libraries of this continent, which aim at rendering more and more efficient aid to the inexperienced student, with a result that a feature which in one decade is regarded as an interesting experiment may become in the next a recognized necessity for every properly organized Library. The problem, therefore, of Library planning, which formerly was limited to the provision of possibilities of liberal enlargement of book-room and reading-room space has now been complicated by the necessity of including reserved-book reading and distribution rooms, special collection rooms, departmental studies, individual studies, a Library extension department, and of providing suitable and convenient offices for a larger staff of attendants, such as is indispensable for working out all the novel features. For the purposes of this memorandum, it will be convenient to set forth the probable Library requirements of the University of Toronto in three divisions in relation to books, readers, and administration respectively.

I. The funds allotted for purchases of books for the University Library have always been less than the average for Universities of similar standing. When the war broke out in 1914, a beginning had just been made of more liberal appropriations, and a policy of yearly increases had been proposed which appeared to meet with the approval of the governing body. But the necessity of rigid economy during and since the war has prevented any such policy from being proceeded with, and the increase of the appropriation for the current year to \$18,000 has not even been sufficient to match the great increase in the cost of books, periodicals and binding. In order, therefore, to bring the Library of the University of Toronto up to the standard of other state University Libraries of similar standing, there is urgent need of a much larger annual grant for the purchase

of books. The following table will show how far behind in this respect the University now stands. The latest available figures are given for the American Universities, those of the year 1918-19.

Name of University.	No. of vols. in Library	No. of vols. added last yr.	Expenditure last year	Appropri. foll. yr.
Michigan	413,000	13,000	\$30,000	\$56,000
Minnesota	280,000	14,800	31,000	35,000
Wisconsin	260,000	11,100	25,000	26,000
Ohio	202,000	21,700	26,000	21,000
Illinois	418,000	23,400	53,000	55,000
Iowa	170,000	11,100	30,000	38,000
Toronto	160,000	4,040	11,000	18,000

The lower annual expenditure of the University of Toronto results not only in a smaller stock of new literature for the work of the year, but in a progressively inferior collection for the purposes of graduate work, which is becoming so important a part of the functions of Universities. To a certain extent this inferiority is not so marked as the statistics seem to imply, because the policy of the Library has hitherto been to spend as little money as possible in duplicating textbooks for undergraduate use, whereas the other Universities have done so freely. In the interests, however, of the undergraduate student, this policy should be altered as soon as an increase in the annual grants permit. At the present rate of annual additions, the stackroom for the books will not have to be added to for four or possibly five years.

II. The readers in the Library may be divided into three classes, members of the Faculties, graduate students, and undergraduate students. There are in use at present three large reading rooms, one for members of the Faculties, in which for their convenience the current numbers of periodicals are also kept, the other two for students, one assigned to men, one to women. There are also eight departmental studies or seminaries which are used both as rooms for small classes and as reading-rooms for honour students in the respective departments. A small collection of reference books is kept on open shelves in each departmental study. It is also intended to use two of the large basement rooms, left vacant this summer by the removal of the University Press to another building, for the purposes of special reserved-book reading-rooms for undergraduate students, in which they may find the text-books and works of reference recommended in their various courses without having to apply for them at the main Delivery Desk. The present arrangement results in much congestion at the Desk at certain hours, and the way out of the difficulty in some University Libraries is to place, under supervision, in another room away from the main reading-room and Delivery Desk, the prescribed books of all the undergraduate courses. A complete solution of the problem has not yet apparently been reached anywhere, but it is becoming recognized that it will probably be found in the principle of separating readers instead of accumulating them in a single room. Whether the two basement rooms above mentioned will be sufficient as reserved-book reading-rooms cannot yet be asserted with any confidence. It is well to bear in mind that, both at Leland Stanford University and at the University of Michigan, which have very recently erected new Library Buildings, the room provided as reserved-book room has already proved too small for the purpose for which it was planned. Profiting by their experience, the Library authorities of the University of Toronto are prepared to open not one but two rooms as reserved-book rooms, but experience alone can show whether further provision should not be made in the next extension to the present building for other separated reading-rooms, perhaps in the form of a connected series of smaller rooms to insure greater quiet than can be obtained in large rooms where readers are constantly coming and going. The departmental studies or seminaries mentioned above are now too few and too small for the classes that use them. In any future extension of the building provision should probably be made for other departmental seminary or study rooms in closer connection with the stack-room. A novel feature of the last addition to the building, erected in 1908-09, was a series of small private study-rooms above the stack-room, to be used by research students. What was then an experiment has proved now a necessity, and many more similar rooms will be needed for graduate students in the literary and historical subjects whenever the next addition is planned. The whole question of what accommodation for graduate students should be provided is as yet uncertain, but there is no doubt that with the growth of graduate work in the University and from the experience of other Universities, provision must be made for great expansion in that respect.

III. The Library administration is suffering from the lack both of an adequate number of assistants and of sufficient space in which to do the work. Here again the outbreak of war prevented what would probably have been a gradual expansion of staff

commensurate with the increase both of book funds and the number of readers. The present Library staff is quite insufficient to carry on all the duties devolving upon it. Only the essential routine work can now be kept up to date, while other things which can bear postponement have to be put aside until additional assistance is obtained. New and desirable features of Library service cannot be undertaken at all. Among these may be mentioned special assistance to undergraduate readers in reference work, and Library extension service to graduates and others outside of Toronto. Other Universities have devoted much attention and money to both these enlargements of the usefulness of a University Library. The staff of the Library numbers at present 17 persons. The University of Michigan Library has a staff of 62, some of whom are doubtless employed in departmental libraries in other University buildings, but, in addition to the regular staff of 62, it also employs a large number of undergraduates on less than full time and these are not included in the above figure. It is safe to say that no University Library in the United States of similar standing to the University of Toronto attempts to carry on its work with less than twice the staff at present employed here. The office space is also in need of enlargement. Some of the existing rooms are as full as the nature of the work carried on in them will permit. The removal of the University Press has set free a small room in the basement, which is being fitted up for work hitherto very unsuitably done in the Faculty Reading Room. In the next addition to the Library building, a liberal estimate should be made for administration rooms.

THE FACULTY OF MEDICINE.

MEDICAL COURSE. PART I.

The education of competent physicians and surgeons involves much more than a training in the use of established methods. The medical faculty must not only see to it that the approved methods of practice are properly learned by the student, and that ample opportunity is given him under supervision, to apply them in the clinics, but it must also provide instruction by which the student's mind shall be so trained that it can comprehend new discoveries and see their application in medical and surgical science.

It is important to point out that this training in independent thought should be given to every member of the class, and not alone to selected groups of the better students. The future advancement of medical knowledge depends as much on careful observation and investigation of the incipient stages of disease by the general practitioner, as on highly specialized research in laboratories and clinics. Detection of disease in its earliest stages and the application of therapeutic measures to combat it rest entirely with the general practitioner and he cannot do this properly unless he is thoroughly trained in powers of accurate observation and has been taught to think independently.

In order that these two functions can be performed by the medical school the latter must be provided with the following:

1. Laboratories that are sufficiently large and well equipped that each student may independently make observations of the structure of the normal body, and conduct experiments to illustrate the functions of the various organs and tissues.

2. Hospital and dispensary facilities offering a sufficient number of patients so that each student may acquire adequate practice in the diagnosis and treatment of disease.

3. A sufficient number of properly trained instructors so that adequate assistance may be given to each student to enable him to overcome the technical difficulties involved in making the observations or experiments, and to guide him in arriving at their correct interpretation and application.

Not only must the laboratories be specially equipped, each for its particular purpose, but their staffs must be composed of men who have been specially trained in that particular field of medical science.

All the departments must moreover be developed to approximately the same degree of efficiency, otherwise the training of the student will be imperfect, not only in the particular subject which may be poorly taught, but also as a whole, because of the interdependence of the courses, the one on the other. It is undesirable for a medical school to specialize along certain lines in the development of its departments. All of them must be developed according to a well thought out scheme of general efficiency if the students are to be adequately trained to deal with the many and diverse problems that arise in the practice of medicine and surgery.

Because of the fortunate association between the faculties of Medicine and Arts in this University, it is unnecessary for the former to assume any responsibility in the teaching of the premedical sciences (Biology, Physics and Chemistry). The departments which more properly compose the medical faculty are those of the funda-

mental medical sciences (Anatomy, Physiology, Biochemistry and Pharmacology), Pathology and Hygiene and the clinical subjects, and it is the purpose of the present report to show the extent to which the laboratory courses must be developed if the University of Toronto is to fulfil its function as a centre for the training of efficient physicians and surgeons and hygienists, who will practise in the State and Dominion. It must train not alone general practitioners for city and country district, but specialists as well.

Following these general remarks, it may be well to state the aims and purposes of the departments of the Medical School, to consider in how far these are being achieved, and then to point out by what means shortcomings and deficiencies could be remedied. A detailed statement of these matters will be found in the report of the Rockefeller Committee.

The aims and purposes of the laboratory departments are:

1. To afford every student the opportunity to carry out for himself in the laboratory the dissections, microscopical studies and experiments that are essential to practical knowledge of the structure and functions of the human body. This demands not only adequate bench space and equipment, but also the furnishing of suitable material upon which to conduct the observations.

2. To provide experienced laboratory teachers or demonstrators so that every student may receive adequate guidance and assistance in his work. In most of the subjects it is agreed by medical educators that there should be at least one teacher to every 15 students in the laboratory subjects. If the supervision of the work of the student at this stage be inadequate, it means that he will go forward to the clinic untrained in the fundamentals of medicine and surgery, and without good training in these fundamentals he can never become a really efficient clinician.

3. To expound the theory of the subject by lectures which must be thoroughly up-to-date, authoritative and well-balanced. If the lectures are merely compilations of text-book matter, they are worse than useless since they lead the student to believe that the medical sciences are stationary and dogmatic and they fail to stimulate him to independent thought. It is in the lecture theatre, more than anywhere else, that a good teacher can inspire the students to aim at high ideals in their work, and to be self-critical and exacting in its performance.

4. To conduct demonstrations, reviews and conferences in which the work done in the laboratory and the theoretical knowledge gained by attendance at the lectures, and by reading will be correlated. To carry out this part of the training properly the class should be taken in groups of 15 to 20 students each and the instructor should encourage the students to discuss with him their difficulties in comprehending the subject.

In the various laboratories of the medical department in this University, all of these ideals cannot be attained at present, for the following reasons:

1. In certain departments, especially Anatomy, Pharmacology, and Pathology, the space is grossly inadequate, even for much smaller classes.

2. Inadequate facilities exist in the laboratories of Physiology, Biochemistry and Pharmacology for conducting many important lines of research because of unsuitable quarters for the care of animals.

3. The number of properly trained laboratory instructors is inadequate (compare Rockefeller report).

4. There are relatively too few instructors of sufficient experience to conduct, with small groups of students, review classes and conferences.

There is no doubt that many of these evils will be removed when the number of students is reduced, but even if the staffs, exclusive of part-time fellows, are retained at their present strength and the number of students in each year is reduced to an average of one hundred, the ratio of instructors to students will fall far short of the accepted standard. Increase in the size of the staff is urgent in all departments.

It may be pointed out here that, with the possible exception of Anatomy, the employment of part-time fellows is highly undesirable, both from the point of view of the student that is thus appointed and of the department. When the salaries paid the part-time fellows are released, by discontinuing such positions, it will be possible to appoint a few more instructors on a full-time basis which will slightly improve the above ratio.

In their organization and equipment the laboratory departments of the Medical Faculty, with the exception of Anatomy and Pharmacology, can be considered as equal to the best in England or the United States, but they all lack in one feature that is essential to their being considered worthy of a great University, and that is in research. Their activities in this direction are hampered mainly by the lack of uninterrupted time on the part of the members of their staffs, because of the relatively large number of students that have to be trained in the essentials of the subjects. In not contributing its share to the advancement of human knowledge the Medical Department is not fulfilling one of its most important functions to the State, for unless the

Universities lead the way in original thought, not only will Medical Science stand still, but it will retrograde, as the history of all times abundantly testifies. The establishment of special research institutes that are independent of Universities can never serve to exonerate the latter from their functions in this regard, and for several reasons, among which may be mentioned, that in most such "institutes" attention is centred on special problems of a more or less applied nature, that the atmosphere is usually uncongenial to the many types of original mind, and that there is not, and through force of circumstances, never can be, opportunity to train new investigators. The last-mentioned reason in itself sufficiently emphasizes the necessity for a greater degree of research activity in the laboratories of the University. Without adequate opportunities to engage intensively in original investigation on some chosen field of his subject, the teacher fails entirely to arouse in his pupils any ambitions to engage in research. He soon comes to be regarded by the student merely as a pedant and he fails to inject into teaching anything that appeals to the imagination, and leads to independent thought.

Among the students that attend the University of Toronto, there are many in every year that could undoubtedly contribute greatly to the advancement of knowledge by original investigation, and later, by teaching, if there were greater opportunities for active research within its laboratories. These opportunities can be afforded by the appointment of *larger staffs than at present*, so that every member can have suitably long periods of uninterrupted time, free from teaching duties to devote to it. In the laboratories of Medical Science, there should be no place for men who have not contributed their share to research or are engaged in its prosecution.

In conclusion a few words may be said about the great advantage to the medical department arising out of its close association with the Connaught laboratories of Public Health. The conspicuous efficiency of this department in the preparation of antitoxins and vaccines for use by the community and the great influence which it has in promoting the control of public health by the State, depend very largely on its close association with the University. In its laboratories researches of great practical value can be conducted provided it can find suitably trained investigators to conduct them and this it is the duty of the medical school to enable it to do. Provision is made in the new Six Years' curriculum of medicine for a more extended and thorough general course in Hygiene, and for optional courses in its various branches.

In this report nothing is stated about the proposed development of the Pathological department so that it may provide laboratory facilities for the clinical departments. This is fully dealt with in the Dean's report.

MEDICAL COURSE. PART II

It became necessary at a recent date to consider the requirements for the future evolution and development of the facilities for teaching and research in the Faculty of Medicine in the University of Toronto. A Committee of the Faculty had this matter under consideration and investigated the most minute details regarding the various Departments of the Faculty. They placed on record a detailed statement of the present facilities and equipment, and the requirements which will be necessary in the immediate future if the efficiency of the various Departments is to be maintained.

The work of the Committee is embodied in an extensive report which contains in detail a statement indicating the present equipment of each Department in the Faculty. It contains a discussion of the requirements necessary for future development and gives reasons for the conclusions arrived at by the Committee. This report, which contains seventy-three folios of typewritten matter, is available for detailed study.

The report was considered by the Council of the Faculty of Medicine and, after certain amendments suggested, was adopted by unanimous vote of the Faculty.

CLINICAL DEPARTMENTS.

1. *Medicine, Surgery, Obstetrics and Gynaecology*—

These three great Clinical Departments require organization along specific lines. The ideal organization possesses certain principles which are common to all three departments. Provision for an efficient staff and adequate facilities for effective Clinical teaching become imperative.

(a) *Teaching*—

The teaching conducted by these Clinical Departments should provide for instruction of three classes of students.

- (1) Undergraduate Medical Students.
- (2) Specialist training for Junior Members of the Staff.
- (3) Post-graduate study for men who have undertaken private practice.

The machinery suggested would provide for the teaching of all three classes. Increased staff is necessary, but it becomes essential that certain members of the staff should be appointed at an adequate Annual Salary for specialized work.

(b) *Research*—

Provision must also be made for Clinical and Laboratory Research, and in this regard the present facilities are most inadequate. If the University of Toronto is to keep abreast of other Institutions of a first-class order it must necessarily provide for the training of specialists and the conduct of Research.

(c) *Laboratories*—

In order that the necessary provision be made for Laboratory space it becomes essential that a building should be erected.

It is suggested that a new building be erected on the portion of the present Hospital grounds which belongs to the University. In this building will be housed suites of laboratories, one for each of the five Clinical Departments, viz., (1) Medicine, (2) Surgery, (3) Obstetrics and Gynaecology, (4) Oto-Laryngology, (5) Ophthalmology. The building will also contain a large lecture room, a museum, a library for students and staff, additional laboratory unit for the teaching of Pathology and Bacteriology, adequate space for animals, etc.

2. *Oto-Laryngology and Ophthalmology*—

The organization in this Department should embody the same principles as those detailed for Medicine, Surgery, Obstetrics and Gynaecology.

3. *Department of Pathology*—

The organization of the Department of Pathology demands a greatly increased staff.

The staff in Pathology will be so organized that provision will be made for supervision by competent members of the staff of sub-departments closely associated with the work of the clinical departments, such as Bacteriology and Surgical Pathology. Thus it is recommended that a Lecturer be appointed in Surgical Pathology. In addition to the appointments requisite for these purposes it is obviously necessary to secure such special assistants as an artist, a photographer (expert in micro-photography), a librarian and a museum preparateur. The artist and photographer will be available for clinical Departments as well as in the Department of Pathology.

4. *Psychiatry*—

The Department of Psychiatry needs much greater expansion. There is widespread interest taken in this subject by the community at large, not only in Canada, but abroad.

The recent remarkable development of this Department and the widespread interest taken in it by the community at large not only in Canada, but abroad, demand adequate provision in the teaching of the subject in the University and in the securing of hospital accommodation.

5. *Hygiene*—

This Department, though organized only on a part-time basis, is responsible for the instruction (graduate and undergraduate) in Preventive Medicine, Hygiene and Public Health, in the Faculties of Medicine, Applied Science and Engineering, Household Science, and the Department of Social Service. The scope of graduate work will be understood when it is pointed out that for the academic year, 1919-1920, ten graduate students were registered in this Department. The staff at present consists of a Professor, Lecturer, Lecturer in Industrial Hygiene and Demonstrator in Sanitary Chemistry, all on a part-time basis. No laboratory assistants or stenographer on a full-time basis have heretofore been provided.

The Research and Antitoxin Divisions of the Connaught Antitoxin Laboratories are staffed in large part by the personnel of the Department of Hygiene. These Laboratories provide adequate funds and facilities for research in Preventive Medicine and Hygiene.

For the extension of teaching and research facilities in the Department of Hygiene close affiliation with the Research Division of the Connaught Laboratories is desirable, in order that the facilities of these Laboratories may be made available for the purpose of graduate (D.P.H. and other) teaching and for Research.

BUDGET INDICATING PRESENT EXPENDITURE AND THE PROPOSED INCREASE OF EXPENDITURE

Clinical and Final Departments

	Annual Expenditure Necessary	Present Expenditure	Increase of Expenditure Necessary.
Medicine, including Pediatrics	\$60,000 00	\$37,600 00	\$22,400 00
Therapeutics	7,000 00	2,000 00	5,000 00
Surgery	40,000 00	11,600 00	28,400 00
Obstetrics and Gynaecology	20,100 00	4,900 00	15,200 00
Psychiatry	16,300 00	1,400 00	14,900 00
Ophthalmology	7,750 00	1,600 00	6,150 00
Oto-Laryngology	8,250 00	1,650 00	6,600 00
Radiology	8,000 00	.....	8,000 00
Pathology	41,000 00	13,000 00	28,000 00
Pathological Chemistry	18,750 00	10,700 00	8,050 00
Medical Jurisprudence	700 00	700 00	.....
Hygiene	15,500 00	8,000 00	7,500 00
	<hr/> \$243,350 00	<hr/> \$93,150 00	<hr/> \$150,200 00

Primary Departments

	Annual Expenditure Necessary	Present Expenditure	Increase of Expenditure Necessary
Physiology	\$32,850 00	\$16,762 00	\$16,088 00
Biochemistry	23,250 00	14,900 00	8,350 00
Anatomy	30,623 00	11,423 00	19,200 00
Pharmacology, including Toxicology...	13,550 00	6,525 00	7,025 00
	<hr/> \$100,273 00	<hr/> \$49,610 00	<hr/> \$50,663 00
Clinical and Final Departments	\$243,350 00	\$93,150 00	\$150,200 00
Primary Departments	10,273 00	49,610 00	50,663 00
	<hr/> \$343,623 00	<hr/> \$142,760 00	<hr/> \$200,863 00

This does not include expenditure for Buildings and Equipment.

THE CONNAUGHT ANTITOXIN LABORATORIES.

The Connaught Antitoxin Laboratories constitute a Department of the University of Toronto.

The Laboratories were established to provide facilities for research in Preventive Medicine, Public Health and Hygiene; and for the production of public health biological products, including diphtheria and tetanus antitoxins, smallpox vaccine, anti-meningitis serum, the Pasteur treatment (anti-rabic vaccine), anti-pneumococcus serum and typhoid and paratyphoid vaccine.

Through the generosity of Colonel Albert Gooderham, the University was provided with a farm of over fifty acres in York Township (the University Farm), on which were erected Laboratories and Stables where preparation of antitoxins and vaccines and serums is carried on under ideal conditions. The value of this gift to the University was seventy-five thousand dollars.

Part of the work of preparing these substances is carried on in the Medical Building of the University. This work is done in what is known as the Antitoxin Division of the Laboratories. There is also the Research Division, the work of which is linked up with that of the Department of Hygiene and Preventive Medicine of the University.

The Antitoxin Division of these Laboratories is, and has always been, entirely self-supporting. There has been every year a surplus on operating in these Laboratories, and this surplus has been used to establish what is known as the Connaught Research Fund, the income on which is available for the support of research in Preventive Medicine. At the present time several researches of great practical importance are being carried on in the Research Division of the Connaught Antitoxin Laboratories, and are supported by the Connaught Research Fund. Dr. Fitzgerald is engaged in a statistical investigation and follow-up study of diphtheria deaths in Ontario; Dr. Caulfield and

his Associates are engaged in a study of certain important phases of the tuberculous problem; Dr. Defries has been investigating certain points with reference to smallpox virus and vaccine virus, and Mr. Moloney and Miss Hanna are studying toxin production by bacteria.

The antitoxins, vaccines and serums produced in the Antitoxin Division of these Laboratories are sold to Provincial and Local Boards of Health. In Ontario free distribution of all of these products is carried on by the Provincial Board of Health of Ontario, who obtain them at a very low price from the Laboratories. The price at which these products are sold to the Provincial Board of Health of Ontario is lower than obtained anywhere else in the world. This fact has been ascertained by Dr. J. W. S. McCullough, Chief Officer of Health of Ontario.

The Province of Saskatchewan is also supplied with diphtheria antitoxin which is distributed free in Saskatchewan by the Bureau of Public Health of that Province.

Alberta, Nova Scotia, New Brunswick and Manitoba are other Provinces whose Provincial Health Departments obtain products from these Laboratories. The same is true of the Cities of Vancouver, Edmonton, Calgary, Saskatoon, Regina, Winnipeg, and of Charlottetown, P.E.I. Certain physicians in the Province of Quebec also obtain antitoxin from these Laboratories.

The Colony of Newfoundland and several of the West Indies also obtain their supplies of antitoxin, etc., from the Connaught Antitoxin Laboratories.

During the past year considerable quantities of antitoxin have been sent to New Zealand for the use of physicians in that Dominion.

During the war most of the antitoxins used in the Canadian Army were prepared in these Laboratories.

The work of the Connaught Antitoxin Laboratories is analogous to that done in the Pasteur Institutes in France and Belgium and to that of the Lister Institute in London, with this advantage on the side of these Laboratories that the Connaught Antitoxin Laboratories are an organic part of the University, are self-supporting and provide funds and facilities for research in Preventive Medicine and also opportunity for graduate teaching in Public Health.

THE FACULTY OF APPLIED SCIENCE AND ENGINEERING.

PART I.

The Faculty of Applied Science and Engineering had its beginning in the School of Practical Science authorized by the Province of Ontario under an Order-in-Council in 1877. The School was affiliated with the University of Toronto in 1889 and by the University Act of 1906, it finally became an integral part of the University as the Faculty of Applied Science and Engineering.

General: Organization and Functions.—As now constituted there are seven regular Departments of graduation leading to the degree of Bachelor of Applied Science:

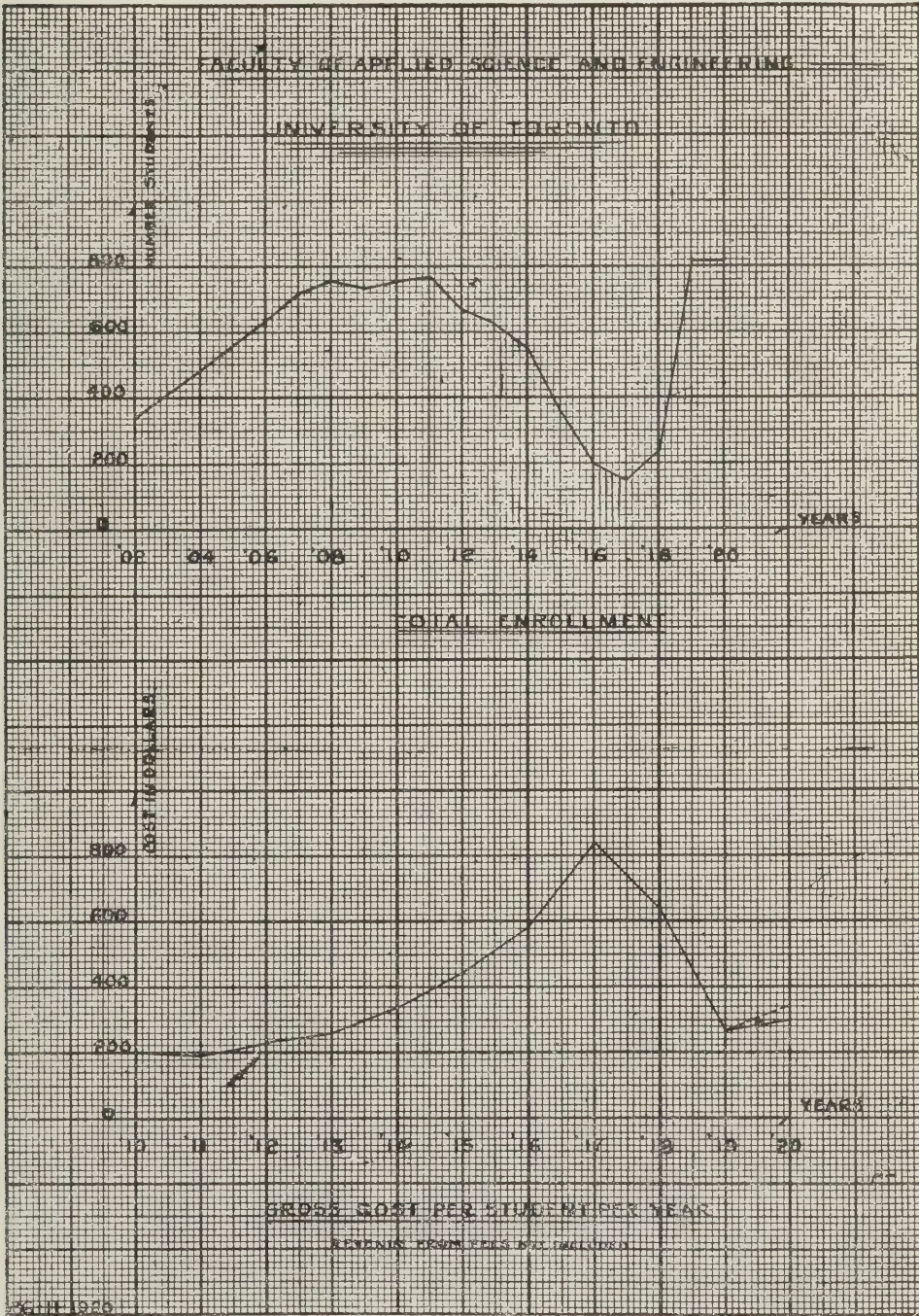
- Civil Engineering.
- Mining Engineering.
- Mechanical Engineering.
- Architecture.
- Chemical Engineering.
- Electrical Engineering.
- Metallurgical Engineering.

The courses extend over the standard period of four years and are designed to give the students a thorough knowledge of the scientific principles underlying the practice in the several branches of the profession, and also such training as may make them immediately useful on graduation whether in purely professional work or in those occupations indirectly connected with Engineering in its various branches.

In addition to the instructional work in the several courses the Faculty performs a useful public service in respect to testing and research work to which the members of the staff devote a portion of their time.

Staff of the Faculty.—The staff consists at present of 103 members, of whom 47 are of professor grades. Of this full staff 75 are engaged wholly upon the Engineering portions of instruction and research and are carried and paid from appropriations made to the Faculty as such; the remainder are members of the Arts or Medical Faculties who lecture in various subjects to the students enrolled in the Faculty (e.g., Mathematics, Languages, Geology, Mineralogy, Biology, etc.).

Represented on the staff are graduates not only of this and other Canadian Universities, but several from British and American Universities and many of the senior members are men who have attained distinction in their respective branches of the



profession and as such have brought great credit to this University; their services continue to be sought as consulting engineers and advisers by various interests both public and private.

Buildings and Equipment.—The buildings occupied by the Faculty are six in number—the “Engineering,” being the original of the School of Practical Science; the “Chemical and Mining;” the “Mill” (Mining); the “Observatory” (Surveying); the “Mechanical” (Thermodynamics and Hydraulics); and the New Building to house Electricity and Applied Mechanics. In addition the large hall behind Convocation Hall is used for drafting.

In general the names indicate the use to which they are put, but it should be explained that the Engineering Building provides for a large part of the instruction common to all Departments, such as drafting, surveying, engineering, physics, photography, applied mechanics lectures (in part); it also contains the Department of Architecture. The Chemical and Mining Building, in addition to these engineering departments, provides for the Department of Metallurgy and is occupied as well by the Departments of Geology, Mineralogy and Electro-Chemistry of the Arts Faculty, although lectures and laboratory work in these are carried on also in other buildings of the University and at the Museum. The New Building is to provide, when completed, for all the lectures and laboratory work in Electrical Engineering and for a portion of the lectures and laboratory work in Applied Mechanics, including the testing laboratories for structural materials; this building is now only partly occupied, the equipment being in process of transference from the old Engineering Building.

The equipment of these various buildings, while generally very complete, has been increased but little during the past few years, excepting the Aeronautics, added during the war, and the Electrical now being installed in the New Building. In general the equipment of laboratories comprises those of the Thermodynamic and Mechanical, Hydraulic, Aeronautic, Engineering, Physics, Electrical, Chemical, Electro-Chemical, Assaying, Metallurgical, Mining, Milling and Concentrating, Strength of Materials (Structural), Highways, Sanitary (with Ontario Board of Health), Cement, Metrological and Geodetic Observatory, Geological and Mineralogical. There are in addition the special equipments of the Art and Modelling studios in Architecture, the very large equipment of the drafting rooms and the Surveying equipment located and used both at the University and at the Summer Camp.

During the past year use was made for the first time of the Summer Survey Camp at Gelert, in Haliburton, which has recently been established with lands and buildings on Gull Lake to provide more efficient higher instruction in geodetic work and in land, railroad, hydraulic, hydrographic and trigonometric surveying. It is the intention to extend this summer work to Mining, Geology and Mineralogy.

Attendance of Students.—The enrolment of students in this Faculty has steadily increased through the periods of “School” and “Faculty” in University connection until about 1911, when there was a slight dropping off which, followed by the war, brought the number down to a very low figure. On the conclusion of the war the enrolment suddenly increased so that during the past year and the present the total (808 and 807 respectively) has exceeded any former numbers. The yearly enrolment is shown on the attached diagram between the years 1902 and 1920.

An analysis of the attendance indicates a very considerable change in the demand by the country as indicated by the relative enrolment in the several Departments. This is evident from the decrease in students in Civil Engineering and kindred branches and the great increases in Electrical, Mechanical and Chemical indicating a decided swing to-day to the industrial side of Applied Science and Engineering education.

Following are tables of distribution of enrolment for the two critical years of 1910 and 1920, which will indicate the change. (Note that the Department of Analytical Chemistry is being discontinued in this Faculty and is replaced by Chemical Engineering, also that Metallurgical Engineering is new since 1910.)

ENROLMENT OF STUDENTS.

Year 1910-1911

	First Year	Second Year	Third Year	Fourth Year	Total
Civil Engineering	138	85	104	55	382.
Mining Engineering	28	14	19	16	77
Mechanical	31	18	66	48	163
Architecture	7	8	5	4	24
Analytical Chemistry	10	5	6	2	23
Chemical Engineering	4	3	2		9
Electrical	56	34	2		92
	274	167	204	125	770

Year 1920-1921

	First Year	Second Year	Third Year	Fourth Year	Total
Civil Engineering	29	58	30	37	154
Mining Engineering	13	25	16	12	66
Mechanical	44	56	33	26	159
Architecture	10	11	3	9	33
Analytical Chemistry				15	15
Chemical Engineering	32	66	38	10	146
Electrical	60	93	40	23	216
Metallurgical	3	9	3	3	18*
	191	318	163	135	807

It is to be observed that the large second year of 318 in 1920 is a result partly of the war and partly of the impetus in Applied Science education; this class as freshmen last year numbered 403. The drop in the enrolment in the First Year to 191 in 1920 is considered to be due to the higher matriculation standard just now applied and a very stringent application of entrance regulations as well as possibly some diminution due to the absorption of returned soldiers.

The Cost, Past and Present.—A review of the cost for administration and work of the Faculty for the past ten years indicates a gradual but slow increase for the few years before the war, then a decline during the four war years to a figure below 1910, and then a sudden rise for last year to a figure 35 per cent. greater than 1910. In considering this fluctuation it is interesting to keep in mind that the number of students enrolled in 1910 and 1920 were almost the same, being 770 and 808 respectively. This range is approximately \$140,000 for 1910 up to \$160,000 in 1914, down to \$125,000 in 1917, and up to \$190,000 in 1919. These figures do not include the *pro rata* amounts for salaries of staff carried on the Arts Faculty giving lectures to Applied Science students which rightly, if considered included, would increase these amounts by from about 10 per cent. in the years before the war, reduce to 8 per cent. toward the end of the war and rise to 16 per cent. at the end and since the war. (None of these figures include any *pro rata* amount of the whole University overhead cost chargeable to this Faculty, nor do they take into consideration the cost of Applied Science buildings nor the interest or depreciation thereon.)

Comparing these yearly costs with the number of students annually enrolled in the Faculty as shown on the first diagram, the cost per student per year has been determined as shown on the second diagram herewith. (These costs, as before, do not include University overhead or interest and are gross costs, i.e., do not take into consideration fees paid.) It will be observed that the rate per student gradually rose in the few years before the war until in 1914 it was about \$330, and then it rose very rapidly during the war (due mainly to decreasing attendance) until in 1917 it reached \$340, and as rapidly fell again until last year it reached about \$270, due mainly to the greatly increased attendance. For the current year it is estimated that with the standard salary list, without the bonus, this will increase to about \$300, and taking the salary bonus into consideration, as now applied for this year, the rate may reach about \$350 (shown dotted on diagram), which, it is to be noted, is an approximation to conditions at the commencement of the war. For comparison, it may also be noted that this rate is lower than those in the larger Engineering Colleges in the United States.

PART II.

The Relation of Faculty to Profession.—As already pointed out the members of the staff participate in the professional work of the country and indeed this is encouraged. The younger members employ their summer holiday periods in Engineering work of various kinds and add not only to their incomes but to their knowledge and experience, and in this manner increase their value to the University. The senior members also give considerable of their time to professional work, and this is encouraged not only during the holidays, but during the session, provided it does not interfere with their work. From this course many advantages accrue to the University, not the least being the broad viewpoint gained and retained through close contact with the activities of the country, and through their high connections as consulting engineers and technical advisers they bring credit and recognition to the University from sources which can be of great assistance to the cause of higher education. For these reasons it is not

*In addition to these in the regular Metallurgical Engineering there are 26 in Mining and 40 in Chemical Engineering of third and fourth years taking Metallurgy.

only desirable to give such opportunities by long summer holidays, etc., but to endeavor to attract to the staff of the Faculty such engineers of standing as will be increasingly recognized by the profession.

The Graduate Body.—The graduates of the Faculty, including those of the School of Practical Science, now aggregate 2,040 and they represent all branches of engineering and technical business not only throughout Canada but in the United States and various parts of the British Empire. It may be of interest to note that of these 1,444 are at present engaged in the Province of Ontario, 78 in Quebec and the Maritime Provinces, 240 in Manitoba, the Western Provinces and British Columbia, and 177 in the United States; 64 are deceased. With regard to the United States it is to be recognized that while many are there permanently, a large proportion will return to Canada as opportunity offers, and bring with them incalculable experience.

The prominent and influential positions held by the graduates and the high quality of engineering work in which many of them are engaged have already brought much credit to this University. So far as the Province of Ontario is concerned, it may be pointed out, for instance, that nearly all the senior members of the technical staff of the Hydro-Electric Power Commission are graduates of this Faculty, and to these may be added the large numbers who are engaged in Engineering work, both technical and administrative, for the Dominion Government, the Provincial Governments, and the many municipal and civic utilities. The alumni are found on Harbour Commissions, Power Commissions, Irrigation schemes and deep water-way projects. In addition to these are the numerous large private technical and business undertakings in which Engineering graduates occupy most important posts.

PART III.

The Requirements of the Country.—Canada, and especially the Province of Ontario, require for the next few years a type of education which will best help the national development in the most direct, substantial and permanent manner. So far as Applied Science and technical education generally are concerned, we realize that its product must be a national asset. The nation's knowledge and dexterity in material things, too, are very determining factors in its prosperity and, if it lacks these, it will not be able to maintain its place; its ability to develop and utilize its natural resources, its aptitude and energy in trade and commerce and its skill in industrial pursuits are the essential elements in these determining factors which in turn depend primarily on scientific education.

The Future of Applied Science.—To fully develop the resources of the country, the resources of the field, forest, mine and river, we must start afresh our study and preliminary planning for those projects contemplated before the war, we must investigate and analyze the newer problems which have arisen in the past few years and must plan for the future on the larger things of the country's development with a wider horizon than ever before.

This means dealing with the great fundamental problems of Transportation, with Mining and its Geological and Mineralogical exploration, with Water Powers and Hydro-Electric development, with Municipal Utilities and problems of health and convenience, with the great basic industries and with the other varied branches of Industry and Manufacture both Mechanical, Electrical and Chemical, which have now entered so much into our national life. It means, too, the awakening of a national style and originality in Architecture, in its combination of Art and Applied Science. And, above all, it means applying and reapplying, through the medium of Research, our scientific knowledge and discoveries, so that we may plan for the work of to-morrow on the results of yesterday.

The Place of the University.—In putting into effect this programme for the country's development the University must play the leading part. It must not follow the trend of events, it must actually lead in the national progress; it must anticipate the country's needs.

The Faculty of Applied Science and Engineering of a National University such as this is, must be prepared to train its students for the national needs not as for to-day but for five and ten years hence. Its policy, therefore, must be laid down with wide vision and with a view to applying the best that is in the country's Human Resources for the development of its Material Resources.

The wide extent of instruction which this involves in its fullest service to the country presents a large problem to the University. It cannot be expected to make engineers of young men in four short years; the fuller process must be carried on in the years after graduation. The University, however, can lay the foundations and educate the student in the practical application of the scientific fundamentals to the

various phases of Applied Science as they are known and practised to-day. It is not its function to teach its students the work of artisans, but primarily to educate them to be original thinkers, designers and constructors, and leaders of character in the service of the community. For this they must have as well a broad education, not wholly technical, and must have enough of those general fundamentals by which they can orient their technical education with the economics of the world into which they enter after graduation.

In the short period of four years, each with an academic session of not more than seven months, it is found most difficult to crowd in all the varied instruction that the needs of to-day seem to demand. It must be remembered, however, that the process of absorption proceeds throughout the summer holidays whereby the student is enabled to apply under actual working conditions, the principles he has learned the preceding winter. In this respect the long summer vacation is of value to both student and staff alike. Neither can the student be expected to specialize; indeed it is considered undesirable beyond such general specialization as is involved in the broad divisions into which the profession is divided.

With these conditions surrounding the education of the young engineer the University undertakes to prepare him for his future work whether purely professional or only remotely so. What that future may be he may not clearly foresee even when he graduates, and when the broad field is presented it is quite evident from its diversity that there is room for uncertainty; then it is that the student commences his process of specialization.

The field of the Engineering profession, now expanded to many times its breadth of forty years ago, covers the wide range of a country's activities. These can only be enumerated:

Civil Engineering constitutes by far the largest field in the profession. It may be divided into many sections such as: Transportation Engineering comprising work connected with steam and electric railways, their construction and operation; Public Works Engineering, including waterways, harbours, docks and terminals elevators; Municipal Engineering, which embraces all branches of water supply, drainage, sanitation and the laying out of streets and pavements with their lighting and traffic questions; Hydraulic Engineering, of importance in Canada in the development of the Hydro-Electric Power, in questions of water storage, supply and control, and closely allied with this are Irrigation and Reclamation Engineering. Connected with the foregoing are the branches of surveying and geodesy and the precise work of mapping. Structural Engineering includes the design and erection of steel buildings and allied with it is Bridge Engineering, the building of re-inforced concrete bridges and viaducts. Highway Engineering, while related to both transportation and municipal, is now assuming such proportions that it is considered as a separate branch.

Mining Engineering also covers a large field and might be divided into the processes of mining and the processes of treatment or milling and refining. The laboratory work embraces assaying with its economic features. The processes involved in the working of our iron, coal, gold, silver, copper, nickel, lead and zinc resources alone cover a very large scientific field.

Metallurgical Engineering can be divided into two distinct parts: the first is the production of metal from the ores and the second the working of the metals as produced. To Canada this is most important as affecting the basic industries of iron and steel, fuels and the economic metals.

Mechanical Engineering, which has a scope approaching that of Civil, comprises that work connected with Steam Engineering, Internal Combustion, Aerodynamical Engineering, Heating, Ventilating and Refrigerating Engineering, Manufacturing and Industrial Engineering comprising the basic industries of grain milling, clay products, cements, glass, textiles and the great number of metal industries. Under this might also be included Naval Architecture.

Electrical Engineering is a steadily increasing profession dealing with Electrical Traction and Transportation, the Telegraph, Telephone and Wireless, Illuminating Engineering and the generation, transmission, distribution and application of electric current to the many utilities and industries of the country.

Chemical Engineering has taken a sudden advance into a leading place in the profession. Chemical Engineering fields are now developed in the pulp and paper industry, in the manufacture of oils, soap, sugar, rubber, textiles, soda and other electro-chemical products which now enter into Canadian enterprises.

Architecture, which is closely related to Engineering, embraces, along with its artistic branches, much of Applied Science in its application of building materials and modern building construction as well as Town Planning and Landscape Architecture. The demands and the trend of to-day offer greater opportunities in this direction than heretofore.

PART IV.

Aims of the Faculty.—This Faculty from its early days has attained a unique place in Canada. This has been due to the personnel of the staff and administration, the high character of work and the quality of the graduates. This place must be maintained.

While the number of students enrolled has, apart from the war, almost steadily increased it is believed that the strength of the Faculty lies rather in the quality of its work and its graduates than in the large numbers. This Faculty believes that it is quality and not numbers which makes a University a power in the country.

It is evident, however, that the number of students coming to this Faculty is steadily increasing, and it may be expected to increase for a few years at least, with the technical activities of this country under post-war conditions. It is to be expected that the present numbers of 808 and 807 of enrolments last year and this are in the process of enlargement and that the figure will approach or pass 1,000 next year. This is based upon the view that the present smaller first year represents a temporary check in the increase owing mainly to the greatly increased matriculation requirements through the operation of which many students have been delayed in coming up; those who succeeded in gaining entrance elsewhere probably need not be expected. For future years beyond the immediate post-war period it is difficult to forecast, but with the assured development of the country and the place which this University has acquired in it, it appears that at least 1,000 students must be expected for some time.

But there is a still further consideration. The present day demands are so great for particular instruction in various branches that the Faculty is faced with the constantly increasing difficulty of providing requisite instruction within the four year period. The experience of other Universities is similar and the criticism of to-day is that students are asked to do too much within the time. The complexity and increasing number of subjects in which instruction is sought also complicates this situation, and while not encouraging a multiplicity of subjects as do some Universities, it must be recognized that this University must meet the requirements of the country.

It is not a question yet for consideration whether or how soon a fifth year may be found necessary or expedient. There are already various arguments for it as a post-graduate year for specializing and research work. If it were established as a special year for the latter purpose and not as a compulsory year of the course it is not yet certain that there would be a large attendance and the expense would not be large. If, however, the course itself were made five years in length the attendance would be increased by say, 200 yearly, and this greater number would be the measure of the greater expense which, of course, would be very considerable.

In addition the subject of Research must be kept prominently in mind. The continuance of the efforts of this Faculty in this direction is essential. So essential is it considered that two years ago a special organization was established within the Faculty called the "School of Engineering Research," through the medium of which this most pressing work could more efficiently be carried on. The success of this arrangement has warranted the course taken and while the large number of students has demanded much greater attention to instruction—which is, of course, the first duty of the staff—it is hoped that with this efficient organization much more research of primary and practical value to the country can be accomplished.

The aims of the Faculty must be directed toward the proper instruction and best efficiency in providing for these large numbers. These students must be given the utmost facilities for their education and for education which they and the trend of national activities demand. The Faculty, too, must do its share, and it must be a large share, in Research of that peculiar type which the various branches of Applied Science in these national activities require and which they expect of a national University.

Requirements of Faculty.—The immediate requirements of the Faculty comprise mainly increased personnel of staff and increased equipment for carrying on work.

It is recognized that with the new responsibilities in its relation to the country's requirements the work of the Faculty must be considerably enlarged. It must provide for some new lines of instruction and it must expand and greatly strengthen certain departments.

It is not necessary to point out the essential requirement that a Faculty of this nature must have its Departments so arranged that they are interdependent; the best efficiency demands an interlocking of the work of various groups or Departments. All the branches of Civil Engineering, for instance, are interlocked; mechanical and electrical depend upon each other; Mining, Metallurgy and Chemical Engineering are so connected with each other, and indeed with Electrical and Mechanical that they cannot be dissociated. Architecture and Civil Engineering are yearly becoming more necessary to each other, especially in industrial fields. In a larger way, Metallurgical and Structural Engineering are interlocked with Architecture. Similarly it may be noted

that there is and will continue to be an interlocking between certain portions of the Chemical, Mining, Metallurgical and Surveying Departments of this Faculty with those of the Faculty of Arts and Forestry.

To build up and expand any of these Departments means a corresponding strengthening of its complementary ones and in this way effort and expense is repaid in a general consolidation throughout the whole Faculty.

With these objectives it is considered desirable to somewhat reorganize the Civil Engineering to provide for and strengthen branches now being more emphasized; Municipal Engineering, Sanitation, Town Planning, Highway Engineering, Irrigation and Reclamation are amongst these. In what is now called Mechanical Engineering it is desirable to make a more definite branch, possibly a separate Department of Hydraulic Engineering on account of its great importance. It is desirable to consolidate the Mining and Metallurgical Engineering more completely with Chemical and Electro-Chemical Engineering, and especially to expand Metallurgical work on account of its increasing importance to the country. It is necessary to extend the programme now entered upon for the greatly increased facilities of Electrical Engineering. In Architecture, which is also in process of considerable expansion, it is desirable that greater attention be given to the art side and a much broader course followed in design in its various branches.

For the later development of the Faculty the provision of further buildings will be essential. It is not yet apparent how soon or how great this will be. The immediate situation is being relieved by the new Building for Electrical Engineering and Applied Mechanics. It is most necessary, however, that within a year and a half at the latest, arrangements now in contemplation be carried into effect whereby the Chemical and Mining Building can be devoted wholly to those groups within this Faculty; this involves the removal of the Geological and Mineralogical Departments to other quarters.

The provision for the future, where 1,000 or 1,200 students must continually be provided for, is another matter. Whether a fifth year, creating a total probably in excess of 1,200, is added or not, the provision of a new main building to replace the old Engineering ("School") Building must assuredly be considered in any building programme. Apart from the unsuitability of this old building it is now quite evident that with 1,000 students it will be taxed to its utmost and that any new building to replace it must, in view of a possible total attendance of 1,200 or more, be of a size considerably larger.

Under any circumstances it must be kept in mind that laboratories and equipment must be enlarged and maintained and that laboratories of this character are necessarily very expensive. It must be recognized, too, that in the very nature of this work adequate salaries and attractive conditions must be offered for staff appointments whereby engineers eminent in their profession can be secured and, above all, retained.

Financial Requirements.—It is not the purpose herein to represent financial requirements in detail. It has been shown that the present cost per student per year is about \$350. This figure is the gross cost without deducting fees paid and is based upon the salaries of the current year (plus the bonus which is being paid), which it is considered should become the fixed salary scale; it also includes the small portion which is provided for under Arts appropriations. With due consideration for the increased personnel and equipment which is required, for the reorganization and strengthening of the various Departments as outlined, it is thought that this should be slightly increased. It is, therefore, considered that for the next five years a student attendance of at least 1,000 should be provided for—with possible increases up to 1,200—and that financial provision should be contemplated on the basis of \$380 per student enrolled within the Faculty, of which about \$350 would be the net amount required for appropriation direct to this Faculty.

FACULTY OF FORESTRY.

The present instruction in this Faculty should be expanded in the following directions—the establishment of: (1) a practice camp and forest experiment station; (2) post-graduate courses leading to the degree of Master of Forestry; (3) a forest ranger course, and (4) a forest products museum. These are necessary for the full rounding out of forestry education in this Province and there is already sufficient demand to justify the University in its inauguration and financial support of them. The objects to be attained by these four lines of development are set forth in the paragraphs below, together with an appendix showing the probable cost to the University.

It is understood, of course, that the cost items given below represent development and are, therefore, in addition to the usual annual budget of \$16,000. No estimates have been made of a new building because it is understood that our requirements in this respect are to be presented in a separate memorandum.

1. *A Permanent Practice Camp and Forest Experiment Station.*—In the past we have been dependent upon the generosity of various lumber companies to furnish camps and working fields for the practical instruction of our students. Each camp has been in a new place and thus the cumulative effect of the students' work in the forest has been lost. This method has proved very expensive in time and money and unsatisfactory from the teaching standpoint. Under an arrangement with the Provincial Forestry Branch the practice camp during the present fall was held in the Timagami Forest Reserve. While as yet no definite announcement can be made with regard to the matter, it is expected that the Provincial Government will soon grant the University a large tract of land to be used as a demonstration forest and practice ground for the students of the Faculty of Forestry. There for six weeks at the beginning of the Third Year and for an equal length of time in the early part of their Fourth Year the men will put into practice as far as possible the things they have learned in their forestry text-books.

In the first place, they usually lay off the boundaries of their practice area and divide it into working sections. The students construct a map showing twenty-five or fifty or one hundred foot contour intervals. This, of course, discloses the topography and drainage and thus indicates where the hauling roads and camps may be conveniently located. The next procedure is to make a forest type map which locates, for example, the pure stands of hardwoods and softwoods and the mixed stands of these species. It also shows the distribution of the barrens, burns, swales, and muskegs, if present. The students then estimate the timber on the tract in terms of board feet or cords for each commercial species.

All these data are placed upon the map of the tract so that one may see clearly the topography and drainage, the location of the logging roads and camps, the nature of the forest types and stands and the amount of material that may be cut in the form of saw logs, pulpwood or cordwood. These are about all the facts with regard to the condition of an area that a lumberman needs for the purpose of logging, but the forester must enter into the condition of the future productiveness of the area, for it is his business to maintain the continuity of the crop. In order to find out the condition of the tract from this standpoint, he must do two things; he must determine the amount of material not yet of merchantable size, and having done this he must determine how fast it is growing, or, in other words, how much wood in board feet or cords will accumulate each year on the average acre. Therefore, in addition to estimating the amount of material now merchantable on the practice area, the forestry students, by means of the data obtained from regeneration and growth study surveys, make estimates of the probable yield at stated intervals in the future. This involves not only a stock-taking of the young growth, but also the determination of the probable death rate as the stands pass from youth to maturity, and this in turn involves, among other things, the making of forest disease surveys.

In order to keep an area continuously productive, provision must be made for the reproduction of the merchantable species at frequent intervals. The natural mortality is very large in a forest and, therefore, there must be an abundance of young trees coming on if the continuity of production is to be preserved. The natural regeneration of the forest is precarious and uncertain and the necessary conditions are not well understood. Yet the study of such conditions forms an interesting and very important part in the formation of plans for an unending supply of pine saw-logs or spruce pulpwood as the case may be.

There is little need of making plans for the future supply of timber on an area if, as is unfortunately the case in some of our best timbered regions, the area has practically no chance of escaping destructive fires. An essential part of the forestry students' work in the practice camp is to work out the details of an adequate system of fire protection. This includes the locating and building of trails and telephone lines.

The work outlined in the preceding paragraphs covers the main things accomplished by forestry students in a practice camp. In the end they have the knowledge and the data necessary for the making of working plans for the tract, plans that extend a long way into the future and if carried out by the owners of the land would result in a supply of saw logs or pulpwood so long as the sun shines and the rain falls, for wood is only solidified sunshine and water with a few mineral salts from the soil thrown in for seasoning. The forester uses his intelligence to direct these processes of nature. Under a let-alone, do-nothing policy there is no direction and there will be no future supply—at least sufficient to meet the present demands on the present commercially valuable species.

As indicated above, the present methods of logging do not as a rule result in the continuance of a forest of the same nature as that removed. In fact, the result is usually a forest of much inferior quality from a commercial standpoint. That this is the case on burned areas is fairly well known, but it is not generally realized that the same condition holds for logged-over areas that have not been burned. Therefore,

if we would maintain the productivity of our forests in pine and spruce especially, we must not only check the ravages of fire, but we must also, in some way, modify our logging methods so as to insure the natural regeneration of pine and spruce. How this can be done in Canada with Canadian species is not yet known and it can be discovered only by experimenting with different methods of cutting, keeping an accurate record of the conditions before and after the operations and measuring the results in terms of the reproduction and growth of the commercial species. The Provincial Government is much interested in such experimental cutting and logging methods, and it is expected that they will be made under the direction of the Provincial Forester and the staff of the Faculty of Forestry on the tract granted the University.

2. *Graduate Courses in Forestry.*—Within the past year we have had six applications for post-graduate work. The applicants are already engaged in research work in some aspect of forestry or allied subjects and wish to prepare themselves better for carrying on their investigations by taking additional work at the University. It has been necessary to turn these men away because at present there are no courses in the University to meet their particular needs.

To meet this demand and to offer to any forestry graduate an opportunity to specialize in any aspect of his profession it is desired to establish graduate courses leading to a Master's degree in Forestry. The number and nature of the courses will depend upon the demand. At present, for example, there should be graduate courses for specialized training in forest tree diseases. A few years ago, the Commission of Conservation wished to engage a specialist to study the balsam heart rot, and it had to go to the United States to get him because there was no available man in Canada with the required training. The Entomological Branch imported a man from the United States to study the spruce budworm, again because we did not have any one with the proper training for the work. The spruce budworm has already killed enormous quantities of pulpwood producing trees in the Maritime Provinces. The toll of fungus diseases in the forest is enormous each year. With growing scarcity and increased cost of timber more attention should and will be given to forest tree diseases. We should train men in our own country for that kind of work and they should have a forestry course for a foundation.

One of the applicants referred to above is making a special study of balsam and another of spruce in relation to the reproduction and growth after logging operations and after fires. Still another is studying the distribution and timber yield of the forests of a province in relation to climatic and soil conditions. They wish to take special courses in methods of field research, silvics, forest ecology and forest geography. We never will know how successfully to modify a forest to meet the needs of man until we better understand how nature makes a forest, and we do not yet know how nature regenerates a pine forest after it has been burned or a spruce forest after logging. Such knowledge is fundamental and can be discovered only by painstaking investigation. The Faculty of Forestry wishes to encourage forest research of this kind by offering courses to prepare men for it.

An increasing number of our graduates are entering the employment of lumber companies, and pulp and paper companies. Some of them have asked for advanced courses in logging, engineering, and wood chemistry. It is for the best interests of forestry to encourage such men to prepare themselves for positions of increased responsibility in large private companies.

The giving of graduate courses will necessitate an increase in the teaching staff. Naturally, such courses should be given by the senior members but they are already overloaded with work.

3. *A Forest Ranger Course.*—Scarcely a week passes that we do not receive an inquiry about a short course in forest surveying, timber estimating, log scaling, the grading of lumber or forest planting from men experienced in work of some kind, but who cannot meet the matriculation requirements or are excluded from a full course in forestry by financial considerations. A dozen or more men in Eastern Canada every year go to forest ranger schools in the United States because they cannot get that type of instruction here. This state of affairs ought not to exist. Such men should be encouraged by the educational institutions of their own country to improve their condition and to make themselves more useful to their employers.

A ranger course would doubtless be very acceptable to the Provincial Government as part of their plans for the improvement of the administration of the timber limits. The instruction in such a course should be given entirely in the forest. The practice tract, if granted us, would furnish the working field and the practice camp most of the equipment needed. If it were considered desirable to give a six or eight weeks' course each year to a limited number, say, 25 or 30, of the more intelligent and progressive fire rangers and timber scalers, the term would have to fall in the period of the

year when their duties in the forest were the least urgent. This would doubtless be in late fall or early spring. They would be on duty in August and September when the practice work for the forestry students is given, and during the best time for the rangers the teaching staff of the forestry school would be on duty in Toronto. So it would probably not be feasible to give the ranger course and the practice camp instruction of the forestry school at the same time. Therefore, another member of the staff would need to be provided to take charge of the ranger course, and when not thus engaged he could give courses to the students at Toronto.

4. *A Forest Products Museum.*—The teaching in tree identification, wood identification, timber physics, and forest utilization is seriously handicapped from lack of illustrative material. More of such material, however, is on hand and in use than can be properly displayed because of lack of space in the old Botany and Forestry Building. A full exhibit illustrating the uses to which Canadian woods are applied in industry is necessary for the proper presentation of a course in forestry. It is possible that such an exhibit might be developed in the Royal Ontario Museum and thus serve the public as well as the forestry students. It is not generally understood by the public that the forests of Ontario have yielded revenues to the provincial treasury since Confederation four times greater than the revenues from the mines during the same period—and the mines, when they are once exploited, cease to be producers, while the forests, when properly treated, are restorable, and their productiveness goes on and on. The importance of the forests in serving the timber-using industries of the Province would justify the expenditure of considerable sums in a forest products museum.

ESTIMATE FOR THE DEVELOPMENT OF THE FACULTY OF FORESTRY.

I. (1) New Building .....	.....
(2) Practice Camp and Demonstration Forest	\$10,000
(3) Equipment for Teaching	3,000
	<hr/>
	\$13,000
II. Additional Staff	\$7,000
III. Maintenance and Apparatus	6,000
	<hr/>
	\$13,000

It is probable that the Provincial Government would construct the buildings for the practice camp.

SCIENTIFIC RESEARCH.

SUMMARY.

Development of Research in other Countries.

Industrial Development depends upon advances in Pure Science.

Universities rather than Special Institutes must train scientists and deal with fundamental aspects of Scientific Research.

It is special duty of University to select men who show aptitude for scientific investigation, *i.e.*, it should have a well equipped graduate school. For lack of this Canada has hitherto lost many of her most promising men.

This involves library, laboratories, and instructors who have proven themselves investigators. These investigators have enthusiasm and attract the undergraduate into graduate work.

Expense of Graduate School proportionately greater than undergraduate.

Attempt to divide graduate work among several universities unsatisfactory. In a large group men stimulate one another. Concentration in Provincial University should not be interfered with. Toronto has good Libraries—University, Royal Canadian Institute and Academy of Medicine. Work of a high order is already being carried on in University Laboratories, but great development is necessary.

Graduate Students number 150. Good nucleus for Graduate School.

There is a flourishing Research Club. Lists of Research Publications in the Annual Reports of the President, also Series of University of Toronto Studies. The Bulletin of School of Engineering Research and the Canadian Historical Review.

The demands of undergraduate instruction on the staff are too heavy. Additional staff needed to free senior men from routine work.

In the past in the face of serious difficulties arising from insufficient equipment and numerically inadequate staff the University has with some success carried on research, but as the special ward of the State it must be enabled to fulfil in greater measure the services the State has a right to expect from it.

MEMORANDUM ON SCIENTIFIC RESEARCH.

The experiences of the Great War and after have rendered unnecessary any extensive advocacy of the value of scientific research. It was her encouragement of scientific research that was largely responsible for the remarkable development of Germany's power during the years preceding the war; it was the application of the results of scientific research that contributed largely to the successful conduct of the war; and in the present period of reconstruction, research in all fields of science is being demanded as never before.

For the organization and development of scientific activities the British Government has established a Commission on Scientific and Industrial Research and has included in its budget for the current year an appropriation for scientific investigation amounting to \$208,000 (as compared with approximately \$114,000 for the preceding year), and a further appropriation for scientific and industrial research of over \$500,000 (as compared with \$243,000 for the preceding year). The United States has a National Research Council for which a permanent home in Washington is now assured. France, in addition to the Department of Scientific, Industrial and Agricultural Research and Inventions attached to the Ministry of Public Instruction, is organizing an Institute of Theoretic and Applied Optics, with a view to building up a great optical industry in the Republic. Italy, giving special attention to the development of industrial scientific research, has already established five Institutions for the scientific investigation of problems connected with as many special industries and is planning for three more similar institutions. And Japan has established an Institution of Physical and Chemical Research with an endowment of approximately \$5,000,000.

Such items are a sufficient indication of the rapidly increasing appreciation of the value of scientific investigation to the State. Popular interest is naturally chiefly concerned with the application of the results of scientific investigation to the solution of industrial problems. But it must not be forgotten that the application of science to any industrial problem rests and must rest upon knowledge of the fundamental scientific principles involved. It is obvious that for the successful application of scientific principles to the solution of industrial problems a body of men, thoroughly trained in the principles of the various sciences, is necessary, and if progress is to be looked for, it is essential that there should also be a body of men devoting themselves to original research in all branches of science. It is to the Universities that the State must look for the supply of these two needs. It may be that special institutes can be established for the intensive and continuous prosecution of researches having industrial bearings in their intermediate and later stages, but the foundations for the successful development of such institutes must be laid in the Universities. Whether it be in pure Science, Engineering, Agriculture, Forestry, Domestic Science or Medicine, the Provincial University already possesses investigators and co-workers in training, who by their attainments and environment are better fitted and better situated for dealing with the fundamental aspects of scientific research.

The need of adequate facilities for undergraduate instruction in the various sciences is so evident as to require no discussion here. In this Age of Science a knowledge of the fundamental principles of at least one science, and, more especially, a familiarity with the methods of science should be a part of the intellectual equipment of every University graduate. But such training as may be afforded in undergraduate courses must be planned primarily for laying a broad foundation of general culture and must, therefore, be insufficient in the majority of cases, for the proper equipment of men for scientific research. Scientific investigation has become so specialized and at the same time so complex, that it is only men of special training and with special aptitude for the work who will be successful as investigators. It is the duty, therefore, of the University, as distinguished from the College, indeed, it is the most important duty of the University, to select the men who show special aptitude for scientific investigation and to give them the training that will fit them for successful careers in any branch of scientific work.

In other words an essential part of the organization of the University should be an adequately manned and equipped Graduate School. In the past it was the custom for Canadian students desiring post-graduate instruction to go abroad that they might profit by the opportunities for advanced instruction offered by the Universities of Great Britain, Germany or especially the United States, no adequate provision for such instruction being furnished in their home Universities. As a natural result many of the most promising of these young men remained abroad, giving their best to the country of their adoption, to Canada's loss. How great this loss has been cannot be calculated, but it is manifestly a serious detriment to the State when it is deprived of the services of its most promising sons. The Provincial University should be in a position to offer advanced instruction in all departments at least equal to that to be obtained abroad, so that none of its alumni should feel obliged to go elsewhere for any special training that may be desired.

What does this mean? It means a library or libraries in which the student may have access to all the important literature bearing upon his particular topic of study. It means laboratories with ample space for graduate work and fully equipped with all needful apparatus. But above all it means the services of instructors, themselves proven investigators, sufficiently free from the routine of undergraduate teaching to give adequate attention to advanced students.

This is a programme of some magnitude but one that must be carried out if the Province is to keep pace with present-day educational requirements. When the Johns Hopkins University, on its opening in 1876, made graduate work its chief concern a new ideal was established for the Universities of the United States and it was not long before other leading institutions took steps to realize that ideal, with the result that now all the greater American Universities have well organized and well equipped Graduate Schools, in many cases with teachers upon their staffs who devote their entire time to research and to their graduate students who are being trained to become independent research workers. The experiences of the war have given a powerful stimulus to the development of such schools and of the type of work they encourage, and now more than ever before the American Universities are offering facilities for research and graduate work which cannot fail to attract earnest and capable students. Nor is the movement confined to the United States. Since the war, too, several of the British Universities—Edinburgh, London, Dublin—have announced the establishment of Graduate Faculties and are endeavouring to attract students to their graduate courses. Their conservatism has yielded to the demand for men with the advanced training which only an adequate course of graduate instruction can give. It is evident that unless the Provincial University can offer courses of graduate instruction equally attractive with those available in the better Universities of the United States the Province and Canada, as a whole, will continue to lose the services of some of her most promising young men. Nor should the pedagogic value of research work by instructors engaged chiefly in undergraduate teaching be forgotten. It raises the status and authority of the instructor in the eyes of his students, it enables him to bring fresh enthusiasm to his work; and, above all, it stimulates him to be on the look-out for promising students who may be trained to enter the research field. It is from among undergraduates that the research workers of the future will be recruited.

A Graduate School adequately equipped and efficiently staffed calls for an expenditure proportionately much greater than that required for undergraduate work, and the development of more than one such school in this Province, would, at present, entail an unreasonable strain upon its financial resources, unreasonable because this would result in an unnecessary duplication of an expensive staff and equipment. Nor would an attempt to divide the graduate work among several Universities prove satisfactory, since this also would involve a certain amount of duplication and would prevent the collaborative work, which, under modern conditions, is essential in scientific research. The frequent meeting of investigators in the more or less closely allied fields of science for the discussion of problems and for the comparison and criticism of results, is a most important factor in research endeavour. The segregation of workers in different localities must necessarily interfere with effective team work.

It is not intended to suggest that research should not be undertaken in Colleges that are not a part of a University having a fully equipped graduate school. Far from it; such independent investigation should be encouraged and supported. Its pedagogic value has already been indicated and the State cannot err in supporting serious and promising research wherever it may be effectively carried on. But this support may be afforded by special individual grants and should in no way interfere with the more extensive development of a Graduate School in the Provincial University. Under the existing conditions as regards population and resources in the Province concentration of effort in one good school is essential and where could that concentration be made with greater propriety than in connection with the Provincial University, especially when in that University there already exists a foundation upon which such a school may readily be built up?

The University of Toronto already possesses a Library of considerably over 150,000 volumes, together with some 50,000 pamphlets, and there are in addition and readily accessible the valuable library of the Royal Canadian Institute, rich in technical periodicals, and that of the Academy of Medicine. A relatively modest increase of the Library appropriation would place the University Library in a position to supply the ordinary demands that may be made upon it in connection with research work.

The Laboratories of the University of Toronto which, not very many years ago, were thought to be ample, now, owing to the increased demands for space for both undergraduate and research work, more especially the latter, are in need of enlargement; and in some departments, indeed, the need for new buildings adapted to modern conditions is urgent, if these departments are to meet the demands that are being made upon them and are to afford facilities equal to those of the Universities of other lands. But in her existing laboratories the University has assets whose value must not be neg-

lected. Work of a high order is being carried on in them, often under great disadvantages, and a concentration of effort upon their extension and equipment, to bring them fully up to present-day requirements would, manifestly, most effectively meet the continually growing demands for higher education and investigation in the Province. If the Provincial University is to fulfil its obligations to the Province and the Dominion, as a whole, it must have an equipment in laboratories and apparatus second to none. In recognition of the demand for advanced courses of instruction, and to encourage and organize graduate study in the University, the Board of Governors in 1909 established a Board of Graduate Studies whose duties were the organization and supervision of graduate instruction and the formulation of requirements for higher degrees (M.A., Ph.D., M.D.). Under the auspices of this Board the number of students pursuing graduate courses in the University rapidly rose until in 1917-18 they numbered 93 and in the current year, when registration is complete, will fall but little, if any, short of 150. In its Board of Graduate Studies the University of Toronto has been the nucleus from which a successful Graduate School may readily be developed. The University has shown an active interest in the development of advanced courses and research, and if certain disabilities that now hamper such work be removed there is ample reason to believe that the University of Toronto will be able to hold its place in the movement towards the development of research that forms so marked a feature in modern education.

The needs of the Library and the Laboratories in this connection have been briefly mentioned, but attention must be especially directed towards the difficulties encountered by the members of the staff who endeavour to carry on research and graduate work. The University of Toronto has always had upon her staff men who were interested in the advancement of knowledge in their particular branch of study, but in the earlier days research work was a matter of individual predilection. To-day conditions have changed; the University staff has been recruited by men who, for the most part, have been trained in an atmosphere of research and feel that the conduct of research work is an important part of their duty. Indeed, many have entered academic life because that seemed to offer the greatest opportunities for pursuing a career in investigation. In the olden days the investigator was more or less isolated, he worked alone; to-day he is surrounded by men pursuing similar aims and with similar enthusiasms. So much is that the case that a flourishing Research Club now exists in the University, whereby members of the staff and graduate workers have opportunities for learning what is being done in other lines of research, thus gaining new viewpoints and suggestions of new methods of attack for their own problems. How extensive the productivity of the University in research has been in recent years may be seen in the lists of publications by members of the staff that have formed part of the President's Report for several years past and in the various publications maintained by the University, such as the *University of Toronto Studies*, *The Bulletin of the School of Engineering Research* and *The Canadian Historical Review*. A statement of the problems now being investigated will be found in Appendix A of this Report.

But research work can be carried on successfully only if the worker can be assured of sufficient leisure from other duties to devote himself exclusively to his problem during definite periods of his time. To the majority of the members of the staff this leisure is lacking. The demands of undergraduate instruction, participation in the work of numerous committees and executive work connected with the supervision of a large department leave little time for the prosecution of research, and in several departments the instruction of graduate students can be carried on only by the sacrifice of time that would otherwise be devoted to research. The University is under-staffed even for the undergraduate work that is demanded of it and as a result graduate work and research suffer. Additional assistants are necessary all along the line that the senior men may be freed from much of the routine work now required of them; indeed, the time has now arrived when senior men who have shown their ability to successfully carry on research work should be enabled to devote all their energies to that work and to the instruction and guidance of graduate students.

The growing demand for fundamental research in all branches of knowledge, and the increasing need for men competent to direct the application of scientific principles to the development of the abundant resources of the Province, are yearly placing additional obligations upon the Provincial University. As the capstone of our educational system it must not only furnish opportunity in its undergraduate courses for a broad and thorough foundation in all departments of knowledge, but it should do its share both by precept and example in adding to the store of knowledge, and it should be in a position to give adequate special training to those graduates who show special aptitude for scientific research. It has endeavoured in the past, with some success, to fulfil these obligations, even in the face of serious difficulties arising from insufficient equipment and especially from a numerically inadequate staff. The Provincial University is the special ward of the State and it is to the State that it must look for the support necessary for the fulfilment of the services the State has a right to expect from it.

APPENDIX A.

Statement of the problems now being investigated in the Laboratories of the University of Toronto.

The following is a statement of the various researches now being carried on in the Laboratories of the University of Toronto, the statement being collated from reports made by the Heads of the various Scientific Departments.

FACULTY OF ARTS.

Department of Geology.

Dean Coleman.—*Glaciation and Glacial Deposits in British Columbia.* This is part of a study of glaciation and glacial deposits in Canada. It has important economic bearings on the character of soils and on the occurrence of sand and gravel beds.

Professor Parks—1. *The great Fossil Reptiles of Alberta.* A continuation of studies that have been in progress for some years, and have an interesting bearing on the doctrine of evolution.

2. (With students) *Studies of the Fossil Representatives of certain Invertebrate Types occurring in the Toronto District.* Part of a revision of the Geology and Palaeontology of the District, having bearings upon its stratigraphical relations and its geological history.

Professor MacLean.—1. *A Study of Colloidal Clays.* This study bears on the utilization of such clays in the manufacture of brick and porcelain and also considers their relations to landslips and subsidence under heavy loads and in railway cuttings and embankments.

Department of Mineralogy.

Professor T. L. Waker—1. *Ores from Cobalt and Boston Creek, Ont.* The identification of associated minerals from these localities with a consideration of the origin and relationships of these materials.

2. *Felspar from Penticton, B.C.* A study of an unusual variety of crystal types of this mineral, which may throw light on the conditions of their formation and those affecting crystallization in igneous magmas.

Professor Parsons—1. *Calcite from Shangoinah Island, Lake Superior.* A study of the type of crystallization of this mineral associated with definite stages of ore deposit.

2. (With Mr. Thomson) *Silver Ores from Silver Inlet, Lake Superior.* The application of new methods to the determination of the constituents of mixed ores. The study may throw light upon the genesis of ore deposits.

Department of Mathematics.

Professor Fields—*A Basis for the Theory of the Algebraic Ideals.* In this study a new foundation is laid for the study of an extended territory in the theory of the algebraic numbers. New results have been obtained and new lines of investigation are suggested.

Professor Beatty—*Algebraic Theory of Algebraic Functions.*

Department of Chemistry.

Professor Lash Miller—1. (With students) *Physico-chemical Studies of the Growth and Death of Micro-organisms.* An application of physico-chemical methods to the study of the conditions determining the growth of yeast cells.

2. (With Professor Burt-Gerrans and students) *On Concentration Changes at the Electrode during Electrolysis.* The experimental testing out of the mathematical theory of the rates at which these changes should take place. It is a continuation of work previously carried out, the results of which have been published in part.

Professor Allan (and students)—*A New Synthetic Method arising out of the Friedel-Crafts Reaction.* This reaction has been found to yield under varying conditions varying amounts of phthalides; these conditions have been determined and thereby a new method has been obtained for the production of phthalides and, incidentally, other organic compounds. This method is being applied.

Professor Kenrick (with students)—1. *The Scattering of Light by Dust-free Liquids.* The study involves the preparation of dust-free liquids and the determination of the extent of the scattering and polarization of light passing through them under varying conditions of temperature, etc.

2. *The Superheating of Liquids.* A determination of the conditions under which the heating of liquids above their ordinary boiling points without ebullition may occur.

3. *The Vapours of Liquids containing two Volatile Components.* The determination of the composition and pressures of the vapours of such liquids by new apparatus devised for the purpose. The study is of importance from the standpoint of chemical thermodynamics.

4. *Solubility and Crystal-habit.* A study of the relative solubility of the different faces of a crystal which may throw light on the question of crystal formation.

Professor Ferguson (with students)—1. *The Reaction between Iron, Hydrogen and Steam at High Temperatures.* A study of the composition and chemical nature of the various oxides of Iron, which may have bearings on the smelting of iron ores, on the development of rust-proof coatings and on the preparation of Hydrogen by the action of iron on steam.

2. *The Permeability of Silica-glass to Hydrogen.* A study of the occurrence of such permeability at high temperatures, to be followed, if the phenomenon is confirmed, by a study of its nature, whether it is mechanical or chemical. Of importance in connection with the construction of Hydrogen containers and also of great theoretical interest.

3. *The State of Combination of the Water of Hydration in Minerals.* Apparatus is being devised to determine this question in the cases of a hydrated zinc phosphate and other minerals. The study bears upon the conditions under which mineral deposits have been formed.

Professor Burt-Gerrans (with students)—1. *The Regulation of the Current in Electric Furnace Arcs.* A continuation of observations on direct current arcs made by a new device; it is intended to extend the observations to alternating currents. The observations bear upon the proper regulation of the currents for the greatest efficiency of such arcs.

2. *Various Problems in Electro-chemistry,* such as the recovery of precious metals from the anode deposits of a nickel refinery; the electrolytic preparation of iodoform; the effects of modifications of the composition of the paste used in "forming" storage-battery plates; the standardization of the chemical treatment of separators for storage-battery plates.

Professor Rogers (with students)—*Various Problems in Analytical Chemistry,* such as the devising of satisfactory methods for the determination of the copper content of white metals and babbitts; for the rapid and accurate estimation in metallurgical processes; of the nitrate content of Chili nitre; and of zinc in the tailings from concentrators.

Department of Physics.

Professor McLennan (with students)—1. *Various Problems in Spectroscopy,* such as the carrying of the series spectra of various elements into the extreme ultraviolet portion of the spectrum; the identification of the series spectra of Lead, Tin and Thallium; the relation between the series spectrum of Mercury and the configuration of the electron systems in its atoms; the determination of the frequency differences of the doublet lines of Hydrogen. All these problems bear on the question of the constitution of the atoms of the elements.

2. *On the Production of Nascent Hydrogen by the Action of Light from an Electric Arc in Helium on a Stream of Hydrogen Gas.* The object of the study is to determine the value of light waves of short length as a catalytic agent.

3. *On the Disintegration of the Atoms of Oxygen by Cathode and Gamma Rays from Radium.* The object of this study is to obtain a basis for the development of a method for tapping the stores of energy known to be stored up in the atoms of the elements.

4. *A Study of the Magnetic properties of the Heusler Alloys and of varying mixtures of their constituents (aluminium, manganese and copper).* The results should have a direct bearing on the solution of the general problems of ferromagnetism.

5. *A Study of the Pressures generated by explosions of mixtures and various gases with air and with each other, including mixtures of the various constituents of paraffin oils with air.* A continuation of work begun last year and involving an inquiry as to whether paraffin oils may be conserved by the use of the products of their fractional distillation.

6. *The Electric and Thermal Properties of Fused Mixtures of Mica and Copper and other Elements.* A continuation of work begun last year.

7. (With Mr. Dobson, Director of the Ontario Hydro-Electric Laboratory, Toronto). *The Behaviour of Helium-filled Incandescent Lamps and of Helium-enclosed Arc Lamps.* To determine if Helium can with advantage be employed in the construction of illuminating agents.

8. *The Liquefaction of Helium.* If this can be accomplished it will furnish a means of obtaining temperatures approaching the absolute zero and so yield opportunity for studying the properties of materials at extremely low temperatures.

Professor Burton (with students)—*Various Problems connected with the Physical Properties of Colloids*, such as the coagulation of colloids by electrolytes; the laws of concentration of colloidal particles in suspension; and the determination of the absolute mass of colloidal particles and of the electric charge borne by them. A thorough knowledge of the physical properties of colloids will contribute to the solution of many physiological problems as well as of problems connected with such industries as tanning, rubber making, ceramics, etc.

Professor Gilchrist (with Miss McCullough)—1. *A Study of the Relation of the Intensity and Duration of an Electric Stimulus to the Effect produced by it in Muscle Contraction.* An attempt to obtain a basis for the standardization of electric currents employed for therapeutic purposes.

2. *An Experimental Testing of the Mathematical Theory of Radiation.*

3. *A Study of the Width of the X-ray Spectrum Lines and the Effect of the Temperature of the Target on the Lines.*

Professor Satterly—1. *The Advance of the Ripple which appears in front of an Ascending Column of Liquid.* A study of the formation and advance of the ripple in relation to the velocity and nature of the liquid, the diameter and nature of the tube, etc. The work may have application to the flotation process of ore separation.

2. *Determinations of Radio-activity in Samples of Minerals, Rocks and Water, brought from time to time to the Laboratory.*

Professor McTaggart—1. *A Study of the Electric Effects at the Surface of Aqueous Solutions in contact with Air or any Gas.* The work has a bearing on such questions as the purification of a water supply, the production of stable suspension in liquids, the action of mordants in dyeing, etc.

Department of Astronomy.

Professor Chant—1. *The Measurement of the Radial Velocities of Stars from Photographs taken with the Objective Prism.* The use of a prism placed over the objective of a telescope enables spectrograms of a number of stars to be taken simultaneously and quickly. Measurements of these plates give information as to the velocity with which a star is approaching or receding from the Sun.

2. *A Study of the Relation between the Velocity of Light in an Electrolyte and a Current traversing it.* The investigation bears directly on the fundamental nature of light and of the electric current. It has been on hand for some time, but its progress has been hindered by other duties.

Department of Biology.

Professor Bensley—*A Research Index of Literature on the Comparative Anatomy of the Rabbit and the Wild Leporidae.*

Professor E. M. Walker—1. *The Anatomy and Development of a recently discovered insect, Grylloblatta campodei formis, which represents a new order.* It is of special interest as being one of the most primitive of living insects.

2. *A Monograph of the Somatochlora group of Dragonflies*, a dominant group in Northern Canada.

3. *A Study of certain Flies, whose larvae sometimes occur in human subcutaneous tissues.*

Professor Piersol—*An embryological study of the aberrant Salamander Plethodon cythronotus.* A study of the development of a salamander with terrestrial ova.

Professor Huntsman—1. *The Faunal Characteristics of the Bay of Fundy.* The fauna of the Bay is being studied in relation to the peculiar conditions presented by its waters.

2. (With Mr. Leim)—*The Life History of the Shad.*

3. (With Mr. Leim)—*A Systematic Study of the Decapod Crustacea of the Bay of Fundy.*

4. (With Miss Chant)—*The Life History of the Smelt.*

All these studies have important bearings on fishery problems.

Professor Clemens—1. *Investigation of the Life History and Growth of the Herring in Lake Erie.*

2. *A Study of the Food of the Trout.*

3. *The Rate of Growth of Pickerel.*

4. *A Study of Classification and Distribution of Mayflies.*

These are all studies having a bearing upon problems connected with our Canadian fresh-water fisheries.

Professor Coventry—*Studies on the Experimental Modifications of Growth.* A study on the growth interrelations of organs and the effects of disturbances of these.

Dr. MacArthur—*Experiments on the Inheritance of Sex Dimorphism.* A study of the inheritance of certain structural characters in fishes; has bearings on the principles of animal breeding.

Dr. Baillie—*A Study of the Variation of the Composition of the Blood of the Rabbit in connection with Transplantation Operations.* This study is expected to throw light on the interaction of organs.

Dr. Craigie—*A Study of the Relative Vascularity of the Brain Cortex in the Rat.* This study bears on the question of the relation of the blood supply to functional activity in the brain.

Department of Botany.

Professor Faull—1. *Studies on the Life Histories of certain Fungi.* Mainly of purely scientific interest forming a contribution to the fundamental understanding of the fungi.

2. *An Investigation of the Needle Blight of White Pine.* This investigation has been in progress during the last three years and has revealed the cause of the disease, its main course and the age of the timber most susceptible. It has an immediate bearing on the steps to be taken to combat the disease, of which serious outbreaks have occurred in the forested areas of Ontario.

3. *The Polyporaceae of Ontario*—A monographic study of a group of fungi, having important relations to timber diseases.

4. *Studies of the Diseases of Canadian Timber Trees.* Data have been accumulated especially in regard to diseases of pines, balsams and other coniferous species.

5. (With Mr. A. B. Jackson)—*The strains of Wheat Rust in Ontario.* It has been shown that different strains of rust occur and that wheats immune to one strain may be seriously affected by another. The object is to determine what strains occur in Ontario.

6. (With A. B. Jackson and H. D. Brown)—*Studies on Fusarium.* Studies of species of fungi that attack cucumbers and asters. The purely scientific side of the problem is engaging attention at present, but it is hoped later that the question of resistance may be taken up.

7. (With E. H. Moss)—1. *Life History Studies on Coprinus.* The object of these studies is to throw light from the development standpoint on the classification and relationship of the gilled fungi.

8. *Studies on Crown Gall and Canker of the Maple and Poplar.* These diseases produce malformations of our timber and ornamental trees and the studies are being made with a view to determine the causes of these malformations and the mode in which they are transmitted.

9. (With A. R. Walker)—*A Study of Keithia thujina.* A study of a fungus which affects cedar saplings with a view to the determination of its systematic position, its life-history, its mode of infection and virulence.

10. (With Miss M. E. Currie)—*Studies on the Slime Molds.* A systematic study of the Slime Molds was completed last year and Miss Currie is now extending her studies to their physiological behaviour, especially their nutrition and their parasitism.

11. (With Miss C. W. Fritz)—*A Study of the Cultural Diagnostic Characters of certain Timber-destroying Fungi.* The identification of the fungi that are the cause of heart-rot in trees is beset with difficulties and this study is an endeavour to discover specific diagnostic features for them by applying to them the cultural methods made use of in the study of micro-organisms. This research is a continuation of work begun last year.

Mr. G. H. Duff—1. *Studies of Life Histories in the Geoglossaceae.* These studies have revealed such an extensive and close parallel in the developmental histories of these fungi to those seen in lichens that an essentially new theory of general relationship between the two groups can now be formulated.

2. *Investigations on the Fundamental Phenomena of Growth.* A technique is being devised which will permit of accurate analysis of the growth phenomena of plants with particular relation to their chemical and time relations. It is expected that the results will be of interest in connection with a recent theory of the chemical constitution of protoplasm.

Professor R. B. Thompson (with assistants)—1. *Studies on the Development and Distribution of Resin Canals in the Conifers.* These are studies on the preservative tissues of cone-bearing plants.

2. (With Assistants)—*Studies on the Minute Structure of Woody Conducting Tissues.* Important in their relation to timber physics, wood identification and wood preservation.

3. (With Miss Haining)—*A Study of the Reproductive Processes in Local Calkin-bearing Plants.* Has bearing upon the inter-relationship and classification of the lower seed-bearing plants.

4. (With Miss Pelluet)—*A Comparative Study of Fossil Canadian Representatives of the Lower Vascular Seed Plants.* Such studies are necessary to complete the work that is being carried on with recent forms.

5. (With Assistants)—*Studies in Plant Breeding.* These studies bear on the question of heredity in plants and on the principles underlying plant improvement.

Mr. H. B. Sifton—1. *A Study of the Structure and Effects of Poisonous Weed Seeds.* The object of the study is to obtain data for the correct identification of the poisonous weed seeds named in The Feeding Stuffs Act of 1920, and also to determine the action of the various seeds. The latter part of the work is being carried on in co-operation with the Department of Pharmacology.

2. *The Seed Coats and Embryo Characteristics in connection with Delayed Germination.* A study in the physiology of seed germination.

Department of Psychology.

Professor Bott—1. *Measurement of the Speed of Simplex Movements of the Upper Extremity by Opposed Muscle Groups.* This study has a direct application to the problems of movement efficiency in industries.

2. *Measurement of the Illusion of Parallel Lines in Visual Perception.* Has a bearing upon the laws of perspective.

3. (With the members of the staff)—*An Application of Group Intelligence Tests to 500 Arts Students of the First and Second Years.* The results of the tests will be compared with the ranking of the students according to their final standing for the year's work and may indicate a method for supplementing the examination method of promoting and admitting students, especially in doubtful cases.

FACULTY OF MEDICINE.

Department of Anatomy.

Professor McMurrich—1. *The ultimate embryonic origin of the tissues of the Vertebrate Fore-limb.* A study begun several years ago but interrupted by other duties. It promises to throw light on certain obscure problems in the morphology of the vertebrate limb as well as on other more general problems of Vertebrate Morphology.

2. *The Anatomical Work of Leonardo da Vinci in its relation to the Scientific Renaissance of the fifteenth and sixteenth centuries.* A study of the history of Anatomy.

3. (With Dr. Herbert B. Wilson)—*The Arrangement and Plan of the Terminal Branches of the Respiratory Bronchi in the Mammalian Lung.* The object of this study is to clear up certain differences of opinion that exist as to this matter and so obtain a more accurate knowledge of the anatomical conditions under which the respiratory exchange of gases takes place.

Dr. Watt—*The Precipitation of lime salts in colloid media.* An attempt to obtain some definite knowledge of the physical and chemical conditions which influence the deposit of lime salts in animal tissues and so throw light on the phenomena of bone-formation and calcification.

Departments of Physiology.

Professor Macleod (with assistants)—*The Physiological effects of decreased Oxygen.* A study of the action of decreased oxygen in its effects on the respiration, on the reaction and gases of the blood and on blood pressure. Results have been obtained indicating the method in which oxygen should be administered in such diseases as pneumonia.

2. *A Study of Surgical Shock.* To determine whether the production of an organic acid (lactic) in the blood and tissues could be the cause of this form of shock. The results were negative, indicating that the suggested treatment of persons in shock by the administration of alkali is not rational.

3. (With Miss Lang)—*A comparison of the Excitability of Muscle with and without its Nerves.* It is expected that this study will throw some light upon the supposed "trophic" influence of nerves.

4. (With Dr. Prendergast)—*The Glycogen Content of the Heart and other Muscles.* Previous observations had shown that the heart always has an abundance of glycogen even when other organs are poor in it. The present research was to discover whether starvation would have the same effect on the glycogen stores of the heart as on that of other organs. The results showed that the heart continued to retain its supply in this condition.

5. (With Dr. Fidler)—*Have the rare gases of the Atmosphere any Physiological Effect?* A study of the respiration, energy exchange and body temperature of animals living in mixtures of pure oxygen and nitrogen or in air containing excesses or deficiencies of the various rarer gases (helium, etc.). The great technical difficulties encountered have been overcome, and it is hoped that definite results on the main problem will soon be forthcoming.

Dr. Olmsted—*Regeneration in Nerves with especial regard to the Effect on Sense Organs.* A continuation of work already started looking to the investigation of the restoration of function in the sense organs after destruction of their nerves and the condition of the sense organs during the ensuing changes.

Dr. N. B. Taylor—1. *The Measurement of Blood-flow in the Hands and Feet in Relation to certain Therapeutic Measures.* A study of the effect of massage, heat and cold, and muscular exercise on the blood-flow, to determine the value of such measures in augmenting the circulation in a given part of the body.

2. *Investigation of the Spread of Artificial Heat in Animal Tissues.* A study of the degree to which heat spreads from the superficial to the deep tissues. As heat is employed as a therapeutic agent it is of importance to know to what extent it penetrates animal tissues.

Department of Pharmacology.

Professor Henderson—*The Action of Atropine.* The object of this study is to standardize the dose necessary for definite effects.

Professor Sharpe—*An Investigation of the Toxic Principles of Certain Weed-Seeds.* Poisonous seeds have been found in mill and elevator waste and as food for stock and the study is concerned with the identification of these seeds and the nature of their effect.

Department of Biochemistry.

The various investigations now under way in this Department centre around one general problem, that of the chemical structure of the protein molecule. A knowledge of this is fundamental for the understanding of the chemistry of vital processes.

The individual problems now being studied are as follows:

Professor Hunter—1. *A Study of the Action of Trypsin on Casein.* The application of a method not hitherto employed for this purpose in the determination of the order and rate at which the various amino acids are liberated from the protein molecule.

2. (With Mr. N. S. Clark)—*A Study of the Trypic Digestion of Edestin.* With the same object as the preceding study.

3. (With Mr. Morrell)—*An Examination of the Arginase Method of determining Arginine in Protein.* An application of this method with the same object as the preceding studies.

4. (With Mr. Green)—*A Study of the Rate of Formation of definite Peptones in Protein Hydrolysis.* With the object of determining more accurately those peptones which have a shock-producing effect, and the stage at which they produce their maximum effect.

5. (With Mr. Urquhart)—*A Study of the Action of Paratyphoid Bacilli in producing Urocanic Acid from Hestidine.* A study of the production of unsaturated acids by the bacterial decomposition of amino acids.

6. (With Mr. Borsook)—*The Separation and Characterization of Proteoses formed during the Peptic Digestion of Gelatin and other Proteins.*

Mr. G. C. Robinson—*A Study of the Action of the Acetone-producing Organism upon Proteins.*

Mr. G. H. Berkeley—*A Study of the Biochemistry of the Grey Mold Botrytis.*

Department of Pathological Chemistry.

Professor Harding (with Dr. Hart)—1. *The Respiratory Exchange in Whooping Cough in Children.* An attempt to determine the compensatory mechanism that must act in the body during the spasm, and so acquire means for calling it more rapidly and effectively into play.

2. (With Mr. Potter)—*The Excretion of Acetone Bodies in Pregnancy.* A continuation of earlier work that indicated disturbances in the fats of the body as the cause of vomiting in pregnancy. The formation of acetone bodies is an indication of fat disturbance and the present study is an attempt to determine the extent of the disturbance.

3. (With Mr. Gaebler)—*The Investigation of some Conditions of Cretinuria.* Previous work had shown that a portion of the creatine formed in the body was formed by the body cells independently of the nature of the food. This study is to determine whether this creatine factor can be controlled and whether the excretion of creatine in pathological conditions may be taken as a guide in diagnosis and prognosis.

Department of Pathology.

Professor Mackenzie (with Dr. Warner)—*A Research upon the Changes in the Adrenal Glands in various Pathological Conditions.* An attempt to establish a relationship between acute infectious conditions and microscopic changes in the glands, and through this to contribute to a determination of the exact function of the glands.

Professor Maitland (with Dr. Cameron)—1. *A Research into the Characters of the Bacillus of Influenza.* A study of a number of different strains of the influenza bacillus to determine the causes of the variations it exhibits and the probable relationship of the organism to epidemic influenza.

2. (With Miss Cowan)—*A Research into the Antigenic Characters of Pathogenic Streptococci.* A study of the immunity reaction of a large number of strains of streptococci in an attempt to determine the relationships of individual strains to endocarditis and to each other.

Dr. H. S. Thomson (with Miss Fraser)—*Studies on a number of problems bearing upon practical Dentistry* such as the permeability to certain bacteria of the various filling materials; the germicidal properties of these materials; the analyses of commercial dentifrices; the preparation of vaccines for use in dentistry; and the effects of diet on degenerative changes in the tooth structure and in the structures of the oral cavity. These studies are being carried on under a grant from the Canadian Oral Prophylactic Association.

Department of Zymology.

Professor Speakman—*A Study of the ferments produced by the Acetone Organism.* Certain of these ferments have the power of converting complex carbohydrates into sugar and their study has interest not only from the theoretical standpoint but because it may assist in the research for a bacterial ferment that will convert cellulose into sugar.

2. (With Dr. Wynne)—*A Quantitative Study of the Results of Starch Fermentation in Acid Media.* It has previously been shown that the addition of certain organic acids to a medium in which starch is undergoing fermentation results in a portion at least of acid being converted into the corresponding alcohol. The study is an attempt to collect accurate quantitative data on this reaction.

3. (With Mr. Robinson and Mr. Berkeley)—*A Study of the constituents of beet-root molasses and sulphite liquor, in their relation to the fermentation of these liquids.* The study includes a determination of the alcohol yields from the different sugars present, the effects of the mineral acids occurring in the liquids and the amount of available nitrogenous compounds present. It is hoped that the results obtained may lead to a better utilization of these waste products from important industries in the production of industrial alcohol.

Department of Hygiene.

Professor Fitzgerald—1. *An Investigation of Diphtheria Mortality in Ontario.* A statistical study having for its object the determination of the factors which contribute to the present diphtheria mortality rate. It is hoped that the study will lead to the inauguration of an educational campaign throughout the Province whereby a reduction of the present excessive number of preventable diphtheria deaths may result.

2. (with Mr. Maloney and Mr. Hanna.)—*A Study of Diphtheria Toxin*. The properties and nature of the diphtheria toxin are being studied and the relation of the toxin to those produced by other bacteria. The study also includes an investigation of the conditions under which a supply of potent toxin may be prepared.
- Professor Defries.—*A Study of Smallpox Vaccine*. A study of the effects of an increase of temperature and the use of certain new antiseptics on the determination of Vaccine virus. The study has already led to the introduction of certain improvements in the methods used in the production of the vaccine in the Connaught Antitoxin Laboratories.
- Dr. Caulfield (with Dr. Hodge and Dr. Fraser)—*Investigations on the Lower Respiratory System*. These investigations include (1) the testing of the value of three biological tests in the early detection of tuberculosis in determining the proper curative adjustment of work and rest and in distinguishing "quiescent" from "cured" cases; (2) a study of the proteins and pollens that may be the cause of such non-infectious diseases as asthma and hay fever and a determination of the correlation that exists between these diseases and the phenomena of anaphylaxis; (3) a study of the effect of high pressure within the chest on the absorption of fluids from the bronchi and the pleural space.

Department of Medicine.

- Professor Graham and members of staff—*An Investigation of the Methods of Physical Diagnosis with Special Reference to Diseases of the Chest and Abdomen*. An inquiry into such problems as the conduction of sound in the chest and the physics of percussion with the object of securing a better foundation for the interpretation of the findings obtained by physical diagnosis.
- Dr. Detweiler and assistants—*Researches in Internal Medicine with special Reference to Infectious Diseases*. Several problems that come under this heading are being investigated, such as (1) the experimental pathology of pneumonia, to clear up obscure points as to the manner of infection, especially in lobar pneumonia; (2) a comparison of the value of Rosenow blood-cultures and those obtained by other methods, to determine the most accurate available method for ascertaining the presence of bacteria in the blood-stream; (3) the prevalence of Syphilis as indicated by the Wassermann reaction, a statistical study of the records of the syphilis clinic; (4) the Wassermann test in pregnancy and pneumonia, a study of the probability that certain cases of pneumonia and pregnancy yield positive results to this test, which has hitherto been regarded as specific for syphilis.
- Dr. W. R. Campbell and Dr. Gallie and assistants—*Researches in Internal Medicine with special Reference to Diseases of Metabolism and Diseases of the Kidneys*. Under this heading the following problems are being investigated: (1) a study of methods of treatment other than surgical on goitres of the toxic variety; (2) a study of kidney efficiency in aged persons, to clear up the difficulty in distinguishing in such persons symptoms due to kidney disease from those due to the natural decline of physiological activity in the later years of life; (3) (with Dr. Gallie) An Experimental Study of the production of the fatal condition known as Calculus Anuria in the hope that light may be thrown upon its causation and treatment; (4) a study of substances occurring in certain kidney diseases which interfere with the accurate estimation of creatinine excretion; (5) a study of certain features of a type of diabetes known as Renal Diabetes; (6) a study of changes in the blood pigment produced by certain pathogenic bacteria; (7) an investigation of the solubility of carbon dioxide in solutions of comparatively low hydrogen concentration, a question that has a bearing on the general problems of metabolism.
- Dr. A. A. Fletcher and assistants—*Researches in Internal Medicine with Special Reference to Diseases of the Joints*. These researches include (1) a study of the various types of arthritis; (2) an investigation into the cause and treatment of disturbances of sugar metabolism in chronic arthritis; (3) the experimental production of disturbances in sugar metabolism by diets deficient in certain food factors.
- Dr. Oille (with Dr. Jamieson)—*Researches in Internal Medicine with special Reference to Diseases of the Cardio-Vascular System*. These include (1) the determination by clinical and X-ray examinations of the relationship of the heart impulse as seen on the chest wall to the left border of the heart, a point of importance in physical diagnosis; (2) an inquiry into the discrepancies between experimental and pathological lesions of the conducting tissues of the heart shown by electrocardiograms.
- Dr. W. F. McPhedran—*A Study on the Dietetic Treatment of Pneumonia*.
- Dr. W. A. Dixon—*The Classification and Culture of various organisms other than Bacteria, causing Diseases of the Skin*.

Dr. Alan Brown (with assistants)—*Researches in Internal Medicine with Special Reference to the Diseases of Children*. These include (1) a continuation of studies on the causation of rickets and tetany; (2) a study of the chemistry of the blood and urine in nephritis in children. An attempt to classify the varieties of nephritis in children; (3) a study of sugar-tolerance in children; (4) a study of the blood volume in infancy; (5) further studies (bacteriological) in infectious diarrhœa; (6) studies of the metabolism in cases of chronic intestinal indigestion occurring in older children; (7) studies of the metabolism in a case of epilepsy with an associated intestinal intoxication; (8) a study of the malnutrition existing in children of school age, this investigation being made possible by a private contribution.

In addition opportunities offered by the Out-patients Department for the study of minor signs and symptoms of disease are being utilized by members of the Out-patient Staff.

Department of Surgery.

Dr. Gallie—1. *A Study of the Clinical Problems of Inflammation and Repair in Tendon and Fascia*, including a study of the changes in these tissues after transplantation.

2. (With Dr. Janes)—*A Study of Problems in the Surgery of the Testes*, including observations on (1) the effect on the testes of the severance of the main duct and the main artery; (2) the possibility of the restoration of function after such procedure; (3) the functional activities of testes transplanted into abdominal positions. The investigation is of importance in connection with the surgical treatment of children with abnormal development of the testes.

Dr. R. R. Graham (with Dr. Detweiler)—*A Study of Infection in the Intestinal Tract with Reference to its Causation and to the Disturbances in other Parts of the Body which result from it*.

Dr. L. B. Robertson—1. *A Research into the Causes of Fatal Poisoning which follows severe Burns in Infants and Young Children*.

2. *A Research into the Poisons produced in certain Cases of Intestinal Obstruction (Intussusception)*. It is hoped that these last three researches will yield results indicating the method of treatment to be adopted to diminish the mortality in such cases.

Department of Obstetrics and Gynecology.

Dr. W. A. Scott (with Dr. Cosby)—*A Study of the Blood Supply of the Pelvic Organs*. To obtain light on the causes of excessive bleeding that may occur from these organs in females.

FACULTY OF ENGINEERING.

Department of Applied Chemistry.

Professor Bain—1. *The Decomposition of Wood at Low Temperatures*. An inquiry into the possibility of modifying the distillation process and so obtaining some of the products in a purer state. The study bears indirectly upon the conservation of our forests by improving the utilization of them.

2. *An Investigation into a New Method of producing Sodium Sulphite*, with the object of discovering a method of preparing this substance—used in large quantities in the paper industry—from materials readily accessible in eastern Canada.

3. *An Inquiry into a Method for Separating the Potassium Carbonate occurring in Wood Ashes*. An attempt to work out a method of making available the potash contained in wood ashes, in view of the fact that no considerable source for potash has yet been discovered in Canada.

Professor Boswell (with assistants)—1. *The Direct Determination of Oxygen in Organic Compounds*. A continuation of work previously done looking to a simplification of the procedure and an extension of its applicability.

2. *The Determination of Magnesium*. It was found that the determination of magnesium by the ordinary method was unreliable in the presence of potassium. The conditions determining the inaccuracy were made out and the nature of the reaction that vitiates the result is being investigated.

3. *The Production of Absolute Formic Acid on a Large Scale*.

4. *A Study of the Constitution of Rubber*. A new formula for the constitution of rubber has been worked out and experimental evidence is being gathered to either confirm or refute it. Important in connection with the synthesis of rubber.

5. *A Study of the Mechanism of Catalysis.* An attempt to throw light on the mechanism by which the velocities of certain reactions are increased by the mere presence of a substance, which, itself, in many cases, remains unchanged. This phenomenon has assumed great importance in both pure and industrial chemistry.

6. *A Quantitative Study of the Complete Carbon Metabolism of the Oat Plant up to the Seedling Stage.* A study of the chemical processes concerned in plant growth.

7. Various problems which, together with some of those mentioned above, bear on the Theory of Solution have also been studied. These are mainly of scientific interest but have given results which make possible an increased yield in certain industrial processes, such as the manufacture of carbolic and oxalic acids.

Professor Ardagh—1. *A Research into the Cause of Activation of Carbon.* An effort to render wood charcoal of use in removing the colouring substances from sugar solutions, petroleum products, etc., for which large quantities of bone-black and Fuller's Earth are now imported.

2. *A Research to Discover a Method of determining Sulphate accurately in the presence of Potassium.* Such a method, if found, would be of great value in the valuation of fertilizers.

Department of Electrical Engineering.

Professor Rosebrugh (with assistants)—*The Devising and Application of Methods for the exact Measurement of signals received in Wireless Telegraphy.* The method devised was independently developed by the engineers of the Marconi Company, and a study of its application is now being made. It is hoped that the study will yield better data for planning overhead radio communication in Canada.

Professor Price and Mr. Duff—1. *An Investigation of the Causes of Inaccuracies in Current Transformers.* The transformers are used for measuring in power lines and circuits. It is hoped that the study will make possible the construction of better transformers.

2. *A New Device for Exact Measurement in Alternating Current Circuits.*

3. *A New and Simple Plan for Automatically holding constant the frequency of Alternating Current Circuits.* Of value in research laboratories, with probable application in power plants.

4. *A New Type of Electric Driving Mechanism for Astronomical Clocks.*

Department of Metallurgy.

Professor Guess, with students—1. *The Possibility of the Recovery of Silver from the Residues of Zinc Retorts.*

2. *A Determination of the conditions of Roasting of a Sulphide Ore that will yield sufficient Sulphurous Acid Gas for the Manufacture of Sulphuric Acid.*

3. *The value of the "Caron Roast" in the Recovery of Silver from Ores containing considerable Manganese.*

These are problems assigned to students for their graduation theses.

Department of Mining Engineering.

Professor Haultain (with Mr. Dyer)—1. *The Analysis of Ball-paths in Ball Mills by Photography.* A study bearing on the variations which occur in the capacity and efficiency of these mills used in the crushing of ore.

2. (With assistants)—*On the Refining of Graphite.* A continuation of work on this problem, the present work being concerned with the separation of the finer sizes of Graphite from Canadian Ores.

3. (With assistants)—*Studies of the Concentration of ores by Flotation and the Hydraulic Classification of crushed ore.* Valuable results have been obtained in the concentration by mechanical means of the low grade ores of the Sudbury district.

Mr. King—1. *On the Assay of Platinum.* A research into methods for obtaining an accurate assay of platinum.

2. *On the Assay of Graphite.* An attempt to devise more rapid and simpler methods in the determination of graphite in its ores.

Mr. Dyer—*An Apparatus for the rapid and accurate determination of Magnetic Minerals in Ore Samples.* Such an apparatus is needed for the determination of the magnetic contents of the low grade magnetic deposits of Ontario.

Department of Applied Mechanics.

Professor Gillespie—1. *An Experimental Investigation into the Strength and Behaviour of Reinforced Gypsum Slabs for Roof Construction.*

2. *An Experimental Investigation into the Effect of varying the proportions of the Various Ingredients of which Portland Cement Concrete is made.*
 Professor Young—*An Experimental Investigation into the Resistance of Reinforced Concrete Beams to Torsion or Twisting.*

Department of Surveying and Geodesy.

- Professor Stewart—*A Determination of the Effect of Meteorological Conditions on Latitude Observations.* A study of the effect of meteorological changes in altering atmospheric refraction and so producing discrepancies in determinations of latitude.

Department of Thermodynamics.

- Professor Angus—1. *A Study of the Insulating values of different Building Materials.*
 2. *A Study of the Efficiency of House Heating Boilers and the best Method of Operating them.*
 Professor Parkin—1. *An Investigation of Air Speed Indicators for Wind Channel Use.*
 2. *The Effect of Wing Tip Form with constant Aspect Ratio and the R.A.F. 6 (a) Aerofoil on the Aerodynamical Characteristics of the Section.* A study of the relative merits of the different wing tips now used in aeroplanes, with a view to developing other forms of higher efficiency.

FACULTY OF DOMESTIC SCIENCE.

Department of Household Science.

- Professor Laird and assistants—1. *On the Extent to which Textile Fabrics are being misbranded in Stores and on the extent to which Silk Fabrics are adulterated with injurious chemicals.*
 2. *On Malnutrition in Children.* A study of the dietetic causes of malnutrition in children as part of a larger plan for the investigation of malnutrition.
 3. *On the Use and Dietetic Value of so-called Egg Substitutes.*

Department of Food Chemistry.

- Professor Benson and assistants—1. *A Study of the Composition of Infusions of Tea and Coffee.* An examination of the actual amounts of stimulant substances and astringents in infusions of tea and coffee prepared in various ways.
 2. *On the changes occurring in the Flesh of Fishes as the result of keeping and of Cold Storage.* This study is being carried on in co-operation with the Biological Board of Canada.
 3. *Studies on the Normal Basal Metabolism of Women of different ages.*

FACULTY OF FORESTRY.

- Professor Howe—*An Investigation of the unburned, cut-over Pulpwood Lands, with special Reference to the Regeneration and Rate of Growth of Balsam Fir and Spruce in certain Districts in New Brunswick, Ontario and Quebec.* This investigation includes the making of surveys of forest regeneration and growth on permanent sample plots and observations in experimental cutting areas to determine the most profitable logging methods which will yet insure another growth of spruce or balsam on the same ground.
 Dr. White—*A Study of the Present Condition of the much burned old Pineries of Ontario, with special Reference to the regeneration of White Pine.* In this investigation some 75,000 acres in Central Ontario have been covered and it will be continued on representative areas throughout the Province.
 Professor W. N. Millar—1. *A Study of the Cypress Hills Forest Reserve.* An investigation of the amount of timber present and of its annual rate of increase, with the object of obtaining data for a plan of cutting and marketing that will render the Reserve continuously productive.
 2. *A Study looking to the Replacement of Pine by Natural Methods on the severely burned Areas of the Petawawa Military Reservation.* This Study involves an investigation on permanent sample plots of the conditions which favour or prevent reforestation by pine in burned over areas.
 3. *Field Studies for the Preparation of Volume and Growth Tables for White Pine and Red Pine in the East and for Engelmann Spruce and Lodgepole Pine in the West.* The object is to determine the average merchantable contents of trees of these species of a given diameter and height class. Such data are necessary in making plans for continuous production.

APPENDIX B.

Statement as to the needs of the various Departments for the more efficient instruction of Graduate Students and for Research.

The following is a resume of replies received from the Heads of the University Laboratories in response to a request for a statement of the needs of the University for carrying on more efficiently work with Graduate Students and Research.

I. The need most frequently expressed is for more space. Graduate work and research cannot be carried on under the same conditions as the routine laboratory work for undergraduates. Quiet, the necessary space for the required apparatus and some guarantee that the apparatus will not be interfered with are essential, and these conditions can only be realized in private rooms or in small special laboratories accommodating only a limited number of research workers.

Some of the laboratories are already so overcrowded with undergraduate students and so inadequate, according to modern standards, for what is required of them, that new buildings for their accommodation are urgently needed. This is especially true in the cases of the Departments of Anatomy and Botany. Anatomy at present occupies a portion of the Biological Building, but the space available for it is so restricted that even the development of the undergraduate courses along modern lines is at a standstill, and accommodation for graduate work and research, such as should be provided for, do not exist. Botany occupies what was originally a dwelling-house, and, besides being hampered by overcrowding and the lack of a suitable lecture-room, is seriously in need of greenhouses necessary for studies in plant physiology and plant pathology.

The continually increasing demands of the clinical departments in Medicine for laboratory space call for a considerable enlargement of the Pathological Building, in which accommodation might also be provided for the Department of Pharmacology now confined to quarters that are altogether inadequate.

For several other departments there are expressions of a need for expansion. Thus the Department of Biology finds need for space to be devoted to animal breeding for embryological and experimental breeding purposes, and to an embryological laboratory; it also expresses a need for a Fresh-water Laboratory where problems especially connected with our fresh-water fisheries might be worked out. The Department of Chemistry needs additional space both for undergraduate and graduate students, the present insufficiency of space being partly overcome by the unsatisfactory method of using rooms in another building temporarily loaned by other departments. The Department of Applied Chemistry calls for space for graduate students, and the Department of Geology for space to be devoted to a laboratory for Economic Geology.

II. Requests for additional laboratory equipment are not frequent, but the hoped for development of graduate and research work will undoubtedly entail a need for special apparatus and facilities in several cases. The Department of Astronomy, however, finds itself seriously handicapped by an insufficient equipment, as a result of which it is unable to prepare its own records in certain lines of work.

III. Several departments urge the advisability of a greater number of fellowships, scholarships and research assistantships, to attract men into graduate work. The demand for men with the quality of training which only graduate work can give has been referred to in the body of this report, and it is generally felt that every possible encouragement should be given men who desire to take such work. Specifically, requests for such foundations have been made by the following departments: Palæontology, Mineralogy, Applied Chemistry, Metallurgy, Mining, Biology, Botany, Hygiene, Gynecology and Household Science.

IV. A need quite as urgent as that for additional space is felt by several departments for the appointment of additional members to the teaching staffs, so that senior members, and, indeed, the entire staff, should have greater freedom from undergraduate teaching and administrative duties to devote themselves to graduate work and research. This need has also been mentioned in the body of this Report, and in the case of certain departments, especially, it is the most serious obstacle in the way of the promotion of graduate work and research. The Departments which have made special mention of this need are as follows: Palæontology, Astronomy, Applied Chemistry, Medicine, Pathology, Pharmacology, Biochemistry, Anatomy and Food Chemistry. It must not be supposed, however, that these are the only departments, of those concerned with this Report, in which a need for a larger teaching staff is felt.

V. Closely connected with the need for additions to the teaching staff, and desirable for the same reasons, is that for skilled technical assistants. In every scientific laboratory much time must be spent in the construction and setting up of apparatus

and in the performance of routine and, for the most part, mechanical, operations in the preparation of material for study. Such work can be done by technical assistants, and much time and energy saved thereby to the research workers for the working out of their problems. The departments making special requests for such assistants are: Palæontology, Biology, Botany, Anatomy and Pathological Chemistry.

UNIVERSITY EXTENSION.

The Department of University Extension finds almost unlimited opportunities for carrying university teaching throughout the Province, but is seriously handicapped in developing these opportunities because of lack of funds. The lines along which work is now being done may be summarized as follows:

1. **TEACHERS' CLASSES, CORRESPONDENCE WORK, and SUMMER SESSIONS** to enable teachers in service to secure the Pass B.A. degree. From the point of view of the youth of the Province there is possibly no more important phase of university activity than the improvement of teachers' qualifications, and the teachers of Ontario are eager to take advanced courses. The enrolment this year is the highest on record because more teachers than before have learned of the existence of these courses. Increased publicity in the form of explanatory bulletins will augment the attendance at Summer Sessions and in Teachers' Classes far beyond the limits prescribed by the present size of the University staff. In a Province where there are almost 15,000 teachers it is not unreasonable to hope for enrolment in the near future of at least 1,000. A greater variety of subjects should be offered in summer courses, and by correspondence during the winter. The latter form of work necessitates, of course, a larger office staff.

The Extension Department does not confine its attention to holders of first class certificates only. Teachers with third class or second class certificates, or even with no certificates, are prepared by correspondence during the winter for the summer courses offered by the Ontario Department of Education; others are given assistance towards the commercial specialist's certificate.

When the degrees in pedagogy are included, it is no exaggeration to say that the Department of University Extension has something to offer to every teacher in Ontario. It is now serving two hundred teachers; with room for expansion it could serve ten times that number.

2. **LOCAL LECTURES.** There is a marked demand throughout the Province for single lectures and for courses of lectures. This demand would be very much greater were it more generally known that the University offers such service. The obstacles here are (a) the expense of publishing and distributing descriptive bulletins and (b) the meagre remuneration to lecturers. Most of the organizations that wish to have this lecture service have only limited funds at their disposal. By regulation of the Board of Governors the local organization is responsible for the lecturer's expenses and an additional sum of \$5.00; to this amount there is added another \$5.00 from the University's funds. Even the lecturer's expenses, plus \$5.00, is to most societies a large sum and prevents them asking for as many lectures as they would like to have. On the other hand, the lecturer who receives his expenses, plus \$5.00, from the organization, and \$5.00 from the University, feels that he is rather poorly repaid for the time and energy expended and the inconvenience attendant upon his trip.

3. **TUTORIAL CLASSES.** Evening classes in English literature and in economics are being carried on for those in Toronto who may wish to take advantage of them. The fee charged each student is \$10.00 for the year's course and the number in any class is limited to twenty. The instructor receives \$200.00 for fifty hours' class work. This rate is not attractive to professors who are anxious to have time for reading and self-improvement, and it does not seem possible to increase the fee without reducing greatly the attendance.

One example of the limitations imposed by lack of funds may be cited. A request came for a tutorial class in Streetsville for the members of the Junior Women's Institute and the Junior Farmers' Institute of the surrounding district. These rural young people were anxious for some course—they scarcely knew of what type. A class was arranged, but the financial difficulty again presented itself, and it is not yet clear where the funds to pay the instructor are to be found.

For both the local lectures and the tutorial classes the service of one or two instructors, giving full time to this work, seem to be absolutely necessary. As at present conducted the system, or rather lack of system, is wasteful of time and money in comparison with the results secured. There seems to be more than enough work for two men—in Peel County alone there are six centres similar to the one in Streetsville. The Province could be literally dotted with tutorial classes for rural young people if a sufficient staff were available.

4. WORKERS' EDUCATIONAL ASSOCIATION. Under this organization over one hundred and fifty men and women in Toronto, and over thirty in Hamilton, are being instructed by members of the University staff and others in such subjects as economics, political philosophy, psychology and logic, English literature, public finance, money and credit, civic administration. For lack of funds these courses have not been very fully advertised; more extensive advertising would treble the numbers. The instructors receive \$150 for fifty or more hours of work in class, but they all regard this as a form of public service and cheerfully accept the duty. (It should be noted that the two hours per week spent with tutorial classes of any type are only the minor part of the time involved—the preparation for the class makes serious inroads on the little leisure available to any university instructor.)

The beginnings of adult education in England were mainly by way of courses of lectures that went by the name of the University Extension Lectures. It happened that there were amongst the original lecturers one or two men of genius, and for the time the influence of the system was very considerable. In 1906, at a dinner of Dons in Oxford, the growing dissatisfaction of labour men in England was voiced by a young Scotch labour man, who took the opportunity given to him of explaining to his audience the fact that the University of Oxford was not doing its duty by the labour world. Out of this grew the organization called The Workers' Educational Association, the basis of which was tutorial classes. The tutorial class gives an opportunity for a group of men and women small enough to make general conversation possible, and, aided by the presence of a trained tutor, to work and think together. The tendency in the English W.E.A. was, as it has been in Toronto, to devote its attention to economic subjects. In England that phase soon passed, and a large demand grew up for the variety of subjects generally included in what constitutes a liberal university education.

In Toronto there was at first the same demand for economic subjects, and there is now the same tendency to branch out into other subjects, such as history, English literature, and psychology. In the present session the largest of all the classes is the one in English literature.

There is, in fact, at this moment a crisis in the whole world of education. It is being discovered that the training provided by the schools and the technical teaching provided by that side of the universities have a tendency to leave out the most important part of education. Neither of them develops, as far as it might, the power of thinking nor of useful criticism; and, what is more important, neither of them goes as far as it might in building up a thoughtful, comprehending human spirit.

Some of the eagerness with which labour people are pursuing their material ends is now being transferred to a desire for a higher culture, and, above all things, this should be encouraged. Nothing severs sets of people more completely than the existence of different and more or less unrelated standards of thinking and speaking. There is immense danger to a country in the existence of two languages, the language of the cultivated and the language of the street, neither of which is really comprehensible to the other. If it could be brought about that more or less the same proportion of every class could be found in the ranks of thoughtful, cultivated people, an immense stride would have been made in the abolition of class differences.

There is another way of looking at this problem, too, and that is this: The working man after all desires not alone material betterment, but a new status and a better life. There is only one way in which he can fit himself for that, and that is by filling his increasing leisure with the materials for better thought.

There is an extraordinary example of what can be done by way of the equalization of classes in such a discussion as that printed by the Garton Foundation in England, in which the method, quality and discussion among six people, of whom three were labour men and three men of learning who were university professors, were quite indistinguishable.

The whole basis of national unity rests upon the theory of the nation being an aggregation of persons who, on the whole, think alike, and it is very difficult for two sets of people to think alike who speak more or less different languages and think in different categories. In the past the reason for these differences has lain to a large extent in the necessity on the part of labour people of stopping their education at an early age, while persons of substance could continue their education for some years onward. This difficulty cannot altogether be cured, but it can be greatly modified in one way, and in one way only, and that is by a large expansion of adult education.

5. A SHORT COURSE INTENDED PRIMARILY FOR MEMBERS OF FARMERS' CLUBS. This is being arranged in co-operation with the Executive of the United Farmers of Ontario. It is to be held for two weeks in February, and the subjects to be offered are economics, public hygiene, architecture, English literature, and Canadian history. The attendance expected by the U.F.O. Executive is between one and two hundred men and women. This course should be made a permanent feature of extension work, and, if at all suc-

cessful, will, no doubt, be largely attended each year. The U.F.O. representatives feel very strongly that this course, since it is given by the Provincial University, should be free of all cost except a nominal registration fee of \$2.00.

Apart from the activities outlined above, the Department of University Extension is prepared to perform any service that any section of the public may require, so far as present facilities will permit. Opportunities for public service of this kind need not be sought; they come spontaneously. And it is most embarrassing to be compelled, for financial reasons, to be somewhat half-hearted at times in responding to some appeals. People everywhere seem to feel that, because they help to support the Provincial University, the cost of its services to them should be merely nominal at most. But in order to carry out even moderate and already urgent developments, a larger office staff, together with increased space accommodation, a teaching staff for winter and summer work, and a much larger budget to provide staff, equipment and advertising, are necessary. With an available budget of \$30,000 for the year 1921-22, present activities could be more adequately developed, and the foundation laid for really large and effective work in the future.

A change is passing over the people of this country, and it is a change for the better. There is an enormous demand for adult education in almost every class of society, and this demand could easily be multiplied by judicious publicity and by compliance with the perfectly reasonable requests that are coming in almost daily. The public look to the University to supply this demand. The average citizen feels that the Provincial University is, in part at least, his own property, and that he has every right to ask for such education as he requires.

The following quotation may serve to illustrate extension arrangements in United States universities, some of which have more than ten times as many students in their summer schools and evening classes as has the University of Toronto. This is from a letter written by the Director of Extension Service in the University of Michigan.

"At the present time there are in this country two general methods of conducting University Extension work. One is known as the Wisconsin plan, under which plan the Extension Division operates almost independently of the regular faculty of the University. For example, at Madison, Wisconsin, they have a separate Extension building and a separate Extension faculty. The plan pursued by the University of Wisconsin. . . enables the Extension Division to carry on a very intensive type of work. I believe the Wisconsin budget (biennial) amounts to something like \$250,000.

"The other plan is that which is sometimes referred to as the Michigan plan. Here our Extension work is carried on through the medium of regular organized University channels. As far as possible we use for this work men of the various departments of the University. This plan does not permit of as varied or extended a programme as that in vogue at the University of Wisconsin; . . . it tends, however, to secure a spirit of co-operation on the part of the entire faculty.

"As explained in our General Bulletin, the University of Michigan Extension Division operates through the medium of twelve bureaux, each bureau touching some phase of our regular campus activities."

In the University of Toronto a combination of these two plans would seem to serve the purpose best. As extension courses in literature and history are in greatest demand, one or two regular extension instructors should be available for full-time work in these two subjects, and members of the regular staff might be asked to give occasional lectures in other subjects as required.

DEPARTMENT OF SOCIAL SERVICE.

FIRST YEAR.

Courses prescribed for all full-time students:

*1. Evolution of Modern Industry (deals with industrial revolution, studies association of capital and labour, and general social and political reactions of modern industrial changes).

*2. Social Economics (elementary principles, relation of wealth to welfare, distribution of wealth and poverty).

*3. Introduction to Psychology (Psychological reactions of social significance).

*4. Social Ethics (Basal conceptions and application to personal conduct and social relations).

5. Social Treatment of Poverty (Causes and inter-relations, social diagnosis, methods of constructive relief and rehabilitation).

*6. Community Organization (development of associations and institutions for extending community life).

*Courses marked with asterisk given by members of Staff of University. Remainder given by city social workers and others.

*7. Hygiene and Public Health (Communicable diseases and their control and prevention).

Each student elects three courses from the following:

8. The Municipality: Its Work and Problems (Municipal and Citizen Organization; Municipality; city government and education, etc.).

9. Recreation and Playground Work (Organization and administration; practical).

10. Child Welfare (The child and the family—care of dependent, defective and delinquent children).

11. Housing and Immigration.

12. Psychiatry (Relation to social work)—Study of symptoms and method of diagnosis.

13. Occupational Therapy (History and application).

14. Rural Conditions and Problems (Relation of rural and urban problems—corollary of courses on Municipality and Community Organization).

Field Work.—In addition to 10 or 12 hours' classroom work a week, each full-time student does 10 to 14 hours' field work weekly.

Aim of Field Work.

1. To introduce student to various forms of social work.

2. To widen the student's environment by a wide experience of living and working conditions.

3. To provide concrete illustration of lectures—rounding out abstract theory by concrete experience.

4. To give some training in active performance of social work.

Method.

1. Individual students—studied and vocational guidance given.

2. One day weekly devoted to observation of social agencies, institutions, factories, department stores, etc. Numerous agencies, firms, etc., co-operate with Department in making this possible.

3. Each student apprenticed to suitable agencies to perform work under supervision (7 hours weekly).

16 city agencies co-operate with Department in this work. Those agencies appoint supervisors at the request of the director of field work, and methods of experience are discussed. American schools dealing with classes of this size provide payment for the supervisors in the agencies which thus co-operate.

4. Weekly field work discussion hour. Current events in social work considered. Special field work experiences discussed and relation of practical work to lectures emphasized.

50 full time students are registered in first year work.

295 part time students take selected courses.

SECOND YEAR.

Continues lecture work of first year and allots large portion of time for field work—students being expected to choose some definite line in which to do intensive social work.

7 full time students are registered.

5 part time students are registered.

Special Features of Work.

1. *City Work:* Director of the Department and Director of Field Work active in various forms of city social work—public addresses, acting as members of Boards, etc.; this helps to develop co-operation.

2. *Course of Public Lectures* on social questions.

3. *Special Extension Courses*, e.g., Mental Hygiene, Employment Management, etc.

4. *Consultation Service:* Department offers this to all interested in development of social work in Canada.

5. *Library:* Borrowing privileges for students and staff of Department of Social Service and Department of Public Health.

Reference privileges for social workers and any others interested in social work.

6. *Occupations:* An outgrowth of field work. Majority of students placed in positions in social work through Department; agencies from all over Canada consult Department in this regard.

*Courses marked with asterisk given by members of Staff of University. Remainder given by city social workers and others.

THE ONTARIO COLLEGE OF EDUCATION.

A SUMMARY OF ITS IMMEDIATE AND LESS IMMEDIATE NEEDS.

The Ontario College of Education was created under an agreement between the University of Toronto and the Department of Education to provide:

- A. Graduate courses in Education.
- B. Courses for High School Assistants and Specialists' certificates.
- C. Such additional courses as may be instituted from time to time.

In the terms of the agreement the budget of the College is to be voted annually by the Legislative Assembly as a part of the estimates of the Department of Education, and the contents of the courses for teachers' certificates, as well as the personnel of the staff, are to be subject to the approval of the Lieutenant-Governor in Council.

A. As to the Graduate Courses.—B.Paed. and D.Paed. courses are conducted by the College both intra- and extra-murally. Attendance during at least two summer sessions is compulsory in the D.Paed. course. During the present Regular Session, intra-mural instruction is given in both the B.Paed. and D.Paed. courses. If, as is probable, the students registered in these courses in the former Faculties of Education transfer their registration to the Ontario College of Education, the total registration will be 221. The Summer Session of 1920 in these courses was attended by 51 students. These figures are evidence of the present demand for advanced or graduate courses in Education. The scores of Canadian teachers who attend Summer and Regular Sessions in Education at Columbia, Chicago and Washington Universities are further evidence. The demand will increase. University laboratories are rapidly expanding the bounds of professional education and organizing it into a science. State systems of education and, in particular, the centralized systems of this continent, need educational experts by the hundreds—principals, supervisors, inspectors, directors and training school instructors. These educational leaders cannot be content with as much of the new science of Education as is imparted to the rank and file of teachers in the typical one year's course of the training schools.

The teachers of the United States realize this. In their universities Education probably stands first among university subjects in the number of registered graduate students.

Development of graduate work in Education will sooner or later involve:

1. An additional instructor in (a) School Administration, (b) Philosophy of Education.
2. Additional Lecture-rooms (2).
3. A Library in professional Education.
4. Complete Junior and Senior (Public and High) schools for experimental work, i.e., the addition of Grades I and II and of the Kindergarten to The University Schools.
5. Half-a-dozen graduate scholarships or tutorships of \$500 each.

B. As to High School Assistants' and Specialists' Courses.—These courses have been organized to include one, and not more than two, of the following subsidiary courses:

1. Course for the Elementary certificate in Physical Culture.
2. Course for the Elementary certificate in Art.
3. Course for the First Class Public School certificate.

Under difficulties by no means insignificant, due to distance and conflict in timetables, the course in Physical Culture is given in the Household Science gymnasium (women) and in Hart House gymnasium (men). A gymnasium on the premises of the Ontario College of Education would save time and increase efficiency.

The course in Art is given by one instructor in one room. This, of course, can never be satisfactory. The greatest immediate needs are (1) a modelling room, (2) store-room for lockers, working material and models.

The course for First Class Public School certificates is supplementary to the High School Assistants' course. Such a supplementary course is necessary. It provides a way—almost the only way—by which college graduates may train for Public School work, and thus for the higher professional posts as inspectors, directors, training school instructors, etc. This course for Public School certificates, which will grow in popularity with an increasing attendance in the High School Assistants' course, requires for demonstrations and practice-teaching a complete and accessible Junior (or Public) School. Completeness here involves again the addition of the Kindergarten and Grades I and II to the list of classes, and of accommodations for physical training—in particular, a gymnasium.

C. As to Additional Courses to be Instituted.—Courses for the Ordinary and Specialist certificates in Household Science have already been instituted. It is not improbable that these courses will be paralleled later by courses for the Ordinary and Specialist certificates in Manual Training.

Temporary and very inadequate provision for the Household Science course has been made this year. Two small, badly-lighted, ill-ventilated rooms have been set apart for a service for which at least five approved rooms are needed—and one additional instructor. When, or if, courses for teachers of Manual Training are instituted, one additional instructor and five or six approved rooms with equipment (forge and stock room, machine shop, drafting room, woodwork room, locker room, etc.) will be needed.

D. As to General Conditions.—(1) The University Schools are the experimental, demonstration and practice schools of the Ontario College of Education. They must be adequate for this function. They cannot be adequate without Kindergarten, Grade I, and Grade II classes. This will require at once three additional classes and three additional teachers, and ultimately five of each. And the Schools must also be model schools. They cannot be model or modern schools, they cannot even comply with the minimum requirements of the Province, until they are equipped with a gymnasium and an assembly hall.

(2) The attendance in the course for High School Assistants this Session is 69. When the Universities have begun to function regularly in the post-war period, this number will probably increase to the pre-war total of 125. Having regard to optional courses, 125 students will mean four classes, and four classes will need four lecture-rooms. At present the Ontario College of Education has one approved lecture-room.

(3) All countries are suffering from a scarcity of teachers. Students do not throng the training schools. In the effort—a desperate effort in some countries—to provide an adequate supply of trained teachers it is very probable that Departments of Education will take vigorous measures to reduce the cost of training. This would probably mean the cancellation of fees for tuition, provision for a supply of text-books and other material, and the establishment of residences or dormitories.

SUMMARY.

If the *Immediate Needs* of the College are met, the budget will contain additional items as follows:

- (1) Five rooms for the Household Science course, one additional room for the Art course, three additional rooms for the High School Assistants' course.
- (2) A gymnasium, assembly hall and educational library.
- (3) A kindergarten and two class-rooms (Grades I and II).
- (4) Salaries of four additional instructors.

When the *Less Immediate Needs* of the College are met, the budget will contain additional items as follows:

- (1) Five rooms for Manual Training, two rooms for graduate work.
- (2) Instructors in graduate courses 2, in Manual Training 1.
- (3) Six graduate scholarships.
- (4) Cancellation of fees, provision for expenses.
- (5) Residences.

APPENDIX II

STATEMENT OF ALUMNI ASSOCIATION OF UNIVERSITY OF TORONTO

MR. CHAIRMAN AND COMMISSIONERS:

I appear before you in a representative capacity as the President of the Alumni Association of the University of Toronto. Though some of the members of your Board are, I know, members of that Association, yet I doubt whether even they are aware how numerous is the constituency that I have the honour to represent.

The provision of the constitution in respect of membership is as follows:

"The membership shall consist of all graduates and undergraduates in any faculty or department of the University of Toronto, and of all persons who have attended the regular exercises of any department of the University for a whole session, and of all members of the governing and teaching bodies of the University and of federated and affiliated institutions."

As you will have observed, the membership embraces not only all graduates of the various Faculties, federated and affiliated Colleges of the University, but also every one who has attended the regular exercises of any department for a whole session. Upon the best information that I can secure the total number of living Alumni (who, consequently, are members of this Association) is not less than 25,000, of whom it is estimated that 18,000 are resident in Ontario, and, out of these, 6,750 are resident in Toronto.

I cannot profess to have received from each of these 25,000 members a mandate to make the representations which I shall submit to you, but for them I have the authority and sanction of that large elected body known as the Council of the Association, as well as of the Board of Directors, who, as you will observe, sign this memorandum.

I am thus authorized to express to you the unqualified approval and full support by the Alumni Association of the representations which have this morning been placed before you on behalf of the Board of Governors and the Senate. I have not only listened to them in their final form as now presented, but those whom I represent have had an opportunity of considering from time to time the substance of these representations, and I am instructed to say to you, in the most emphatic and unequivocal way, that they have the full and hearty support of the Alumni.

Now, having said so much in general terms, I pause to make one personal observation, viz., that it has fallen to my lot to sit as a Commissioner on matters of public interest, and I found little advantage from the bare repetition by different witnesses of the same statement.

I could not hope to add anything to the admirable presentment which has been made on behalf of the Board of Governors and the Senate. Anything that I could say would be no more than a weakened and feeble restatement of what you have already heard.

For these reasons I propose to dispense with any reiteration of the representations which have been made by the Board of Governors and Senate, though in respect to one or two of them I am desired, on behalf of the Alumni, to add a few observations.

The Alumni Association desires to emphasize the broad fundamental consideration on which, in their view, the conclusions of your Commission, Sir, must be based, viz., that the University of Toronto for some years prior to the war had been in a process of development and expansion necessitated by two causes.

1st. By the increasing numbers of those applying for admission to the University, thus demonstrating the increased demand by the people of this Province for a University training.

2nd. By the necessity for more adequate equipment of all departments and by the necessary addition of new departments, so as to fulfil the requirements of a University of the first class and to keep it on a par with the other great universities of this continent.

At the beginning of the war in 1914 this development and expansion was proceeding, but had not kept pace with public requirements. The war arrested it, and now the war being over the public demand for increased University education, for expanded accommodation, for improved facilities, and for the addition of new departments is more overwhelming than ever, and to meet it there are only the facilities which existed before the war and which were inadequate even then.

Let me repeat. It is the requirements of our people in regard to University education that necessitates expansion. The expansion can be accomplished only by the grant to the Provincial University of an increased revenue, constantly expanding as the Province expands and develops in population and wealth.

RESEARCH.

Next, I desire to mention, without elaborating it, the necessity for increased facilities in the department of research. That necessity is realized more particularly by those of the Alumni who are engaged in manufacturing and allied commercial pursuits. To them the convenience and value of an adequate and convenient research department here in the centre of the Province to which they can come in person for assistance and advice without a trip to Ottawa or elsewhere, appeals with special force.

But quite apart from that specific and narrow ground, it seems to me that the time has now arrived in the history of the Provincial University when there should be devised and established a definite plan of development in accordance with which its future development should be consciously directed, not alone in scientific research, but generally in order that it may maintain and increase its position as an institution of the highest learning. That means on the academic side quality as distinguished from quantity. It means development at the top and possibly it may mean that certain portions of junior undergraduate work should be relegated to Collegiate Institutes.

The Alumni suggest to you that a great Provincial University of the highest type is essential to the rapid and permanent development of our natural resources and thus of the wealth, comfort and highest civilization of all our people, and that if, in the days to come, we are to secure and maintain such a University of the highest standing it is desirable that your Commission should now formulate a well-balanced plan for future development, so that its growth may not be by way of accretions to an amorphous mass, but on definite lines laid down by this Commission. The Alumni trust that you, gentlemen, may find it within the scope of your Commission and within your power to formulate such a plan.

SALARIES.

I would also refer very briefly to the question of salaries. The Alumni, distributed as they are through all walks of life and through all parts of the Province, appreciate very clearly how the purchasing power of the dollar has decreased, and appreciate how essential it is that the professors and administrative officers of the University should receive an increase of salary in some degree at least comparable with the increased income now received by men of like standing in American Universities and by men of like standing in other walks of life. If not, we must lose our best men. Salaries must be raised or the standards of the University must be lowered. On that point we wish to refer you to reports for 1919 and 1920 of the Presidents of the large American Universities. You will find in those reports a more cogent presentation of the salary question than we could possibly present.

The Alumni whom I represent include those of the Federated Universities and Colleges which now form part of the University of Toronto, and, on their behalf, I wish to add in the strongest possible manner our accord with the representations made officially by their governing bodies. In entering Federation they did so upon request, and to further the principle that "Unity is Strength." By so doing they made great sacrifices and deprived themselves in large measure of possible endowment and financial assistance from those who would have aided them as separate institutions. If the University which they joined and to which they are proud to belong, should not receive from the Government the support which they were led to expect, it would not be going too far to say that there would be a breach of faith. In the language of the Report of the University Commission of 1906, "The reluctance of the Federated bodies to resign their independent existence sprang from causes hostile to them. It arose from pride in their own colleges, and they doubted whether the relinquishment of advantages gained by so much sacrifice and loyalty was a wise step."

That by the completion of Federation these advantages have now been relinquished is an outstanding fact which, we submit, is entitled to remembrance and recognition.

These four points, viz.:

- (1) The fundamental necessity of increased facilities,
- (2) The development of the University at the top,
- (3) The increase of salaries to the staff, and
- (4) The obligation to the Federated Institutions,

I have mentioned because, though already dealt with, I think they come with peculiar force from the constituency whom I represent. That concludes what we have to say in support of the memorandum presented by the University Authorities.

But there are certain considerations which have not been specially touched upon in the presentment of the Senate and Board of Governors and which seem to us to be not only pertinent, but to be peculiarly appropriate for presentation to you, Sir, by the Alumni Association.

The Alumni desire to attract your attention to three of the activities at present connected with the University so that if the considerations which we present commend themselves to your Commission you may recommend the development, improvement and strengthening of these activities. These three are: (1) The Bureau of Publicity; (2) the University Alumni Association; (3) that branch of the Registrar's office which keeps the official records of graduates, their addresses and the personal and geographical files of all the Alumni.

The operations of these three activities are closely interlaced and mutually dependent on each other.

They might be designated as the productive activities of the University, and they will present to you certain considerations which are entirely distinct from those which relate to the strictly academic side.

Let me explain that in what I am about to say I am not criticizing any past action of the Board of Governors, the President or the Registrar in respect to any of these matters. The Alumni Association could not have developed as it has but for the generous assistance it has received from the Board of Governors. We are all aware that the President is fully alive to the importance of these three activities and has done all that he could to aid them, and the Registrar has done all that was humanly possible with the file records, having regard to the limited equipment and staff at his disposal.

My point is, that they ought on principle to be strengthened, expanded and developed, and it will pay to do so.

The work of a Bureau of Publicity has two branches:

(1) To disseminate information to the general public regarding the University and what it is doing.

(2) To ensure frequent and regular communications from the University to its own Alumni.

In a democratic country such as this every public body realizes the necessity of justifying to the people at large its administration of the affairs committed to its charge.

Outstanding examples of this demand and of compliance with it are afforded by the practice of our Government, both Dominion and Provincial.

The Hansard reports of Parliamentary Debates, the Blue Books, the discussion of public questions in the Press, the speaking tours of Ministers of the Crown, and the Bulletins on the current work of the Departments which are now sent out by the Provincial Government, all afford examples showing the inexorable character of the principle I have stated. The Provincial University is a public body dependent for support on the Provincial Exchequer. In University matters the principle to which I have just referred has been applied only to a very limited extent. It is true that this year the Board of Governors has appointed a gentleman to devote part of his time to publicity. The Alumni Association desire to express their approval of what has been done in this regard, to bear testimony to the excellent quality of the work that is being done, and they hope that your Commission may see its way to recommend that the beginning which has thus been made should be continued and extended by establishing an adequate publicity bureau.

The Alumni Association is of the opinion that only through such a bureau of publicity can the people of this Province be brought into contact with the University and be made to realize the benefits to themselves as well as the needs of the University, thus breaking down the isolation which is frequently the bane of Universities—a phrase used by Lord Fletcher Moulton recently, speaking of the position of the University of London.

Time has not permitted us to gather the data to lay before you the exact extent in which such action is in operation in the great Universities of the United States, but sufficient information has been obtained to warrant the general statement that over there it is almost universal, and has attained very great proportions.

The other branch of publicity is keeping the Alumni in touch with the University and maintaining their interest by more frequent and regular communications to them on its affairs. I mean not merely personal news of individuals, sports and athletics, the establishment of new departments, the erection of new buildings, but also the general development of thought around the University and such graver matters as you are now considering.

Such communications with an organized effort by the Alumni Association to foster reunions of classes at convocation or other suitable times and to hold occasional gath-

erings of the local Alumni in outside towns, seems to be the most effective way of eliminating a feeling which undoubtedly exists, that the University as such takes no interest in its Alumni and never approaches them except to ask for money.

Such a bureau of publicity, functioning under the supervision of the President and in close co-operation with the Alumni Association, seems to us to be a matter of the first importance. We do not suggest that your Commission should name any particular sum for its extension. That is probably a matter that can best be dealt with by the Board of Governors, but what we do ask is that among other matters you consider the suggestions now made and that if they commend themselves to you that you make such recommendations on this subject as will strengthen the hands of the President and Board of Governors in extending and developing such a bureau of publicity.

Next in the group of activities above mentioned is the Alumni Association, and I wish to say a few words in regard to it, premising that no financial support is asked beyond that which it is now receiving.

But we think it will be of value to you, in considering the third point (the file record), to know something of the past work and of the aims of our Association.

As one instance of what has been done I want to refer to the Memorial Fund. You all know the magnificent way in which the undergraduates of the University responded in the great war; many of these men were, to a large extent, dependent on their own resources in obtaining a University education. It naturally happened that many of them came back with their resources so depleted that they could not complete their course at the University without aid.

When the Dominion Government finally decided that it could not assist returned University students by giving such aid, the Alumni Association stepped in and did for these men what the Government declined to do. Notwithstanding the difficulties under which it laboured, and to which I will refer later, the Alumni Association has during the last two years secured from its own members and from the friends of the University, subscriptions aggregating not less than \$336,457 for the University War Memorial Fund, and out of this sum more than \$250,000 has actually been paid in.

From this fund there was, in 1919-20, lent to returned men who, without assistance, were either unable to complete their college course, or in some cases enter it, the sum of \$37,462. This sum was lent to 152 students.

This year applications have been received from 215 men, and the amount asked aggregates \$73,000. Up to the present time loans have been arranged aggregating \$42,426 to 188 students, and some applications remain to be considered.

Of money lent last year to men who graduated last June about \$2,500 is repayable this year, and of that sum \$1,834 has now been repaid. All payments that have fallen due have been met usually on the very day with, I believe, one exception. This borrower expects to repay next May.

I wish that every member of your Commission could meet these men. It has been a privilege for me to do so. If time permitted I could tell you some of their stories. Not only did those boys come back; they came back with an active interest in college life on all its sides. They were enlightened by the war, but not disillusionized. They valued the poetry which they found at the University all the more on account of the hard prose which they had to study elsewhere.

If these young men are a fair sample—in moral fibre, courage and resource—of the men that this University is turning out, I for one have no pessimistic doubts about the future of this country.

When the need for these loans to returned men slackens so that the way is clear, the Physical Memorial will be built.

Its chief significance to the University will lie in its silent record of the devotion of her sons whose names are there recorded, forming an inspiration to future generations of students, and sentiment will be reinforced by the wonderful architectural charm of the memorial.

To those of us who believe with Newman that the intangible influences of a University are of even greater importance than the tangible assets, the completion of this memorial will mark an epoch in the history of the University.

That, Sir, is one thing which the Alumni Association has done. They also helped returned men by establishing an employment bureau, and they have to their credit other accomplishments even with the difficulties now standing in their way. But I shall not weary you with a reference to them, for I think the Memorial Fund by itself is sufficient to indicate the value, not alone to the University, but to the Province, of the work of this Association.

Now one word as to the ideals and future aims of the Alumni Association. In the present condition of unrest and difficulty following the great war there is, we think, a peculiar necessity in the public interest that Associations of College men throughout the Province should be developed, intensified and if possible made permanent to the

end that their united and co-ordinated assistance and influence may be availed of by this Province in meeting and solving the grave problems that loom on the horizon. I refer to Associations of College men, not as segregating them from the rest of the community as a special class, but because it is in the interest of the Province to secure their more active interest and intervention in the solution of these problems; because if a college training does anything for a man, it tends to give him a developed capacity for sane thinking and sane action in such matters, and because he comes to the consideration of these questions with some knowledge of history, of the problems of the past and their attempted solution, and with a tendency to consider fairly the claims of agitators so far as they are founded on real grievances. The growth of any substantial association of such men naturally centres about the University, and can only be promoted by the development and strengthening of such an association among its Alumni.

Such associations may undoubtedly develop around each of our Universities, and, indeed, around our Colleges, but no argument is needed to establish the conclusion that by far the most effective of such associations must naturally be that which develops about the Provincial University, with 5,000 students in attendance seated in the capital of the Province and in a city that contains nearly one-fifth of its whole population, and with 6,750 Alumni in that city. The direct financial aid which the Alumni Association can at present render to the University is negligible; in fact, it is an expense, but I firmly believe that the future of the University depends in large degree on the extent to which the interest of the Alumni in the University is nurtured and developed.

Let me read you a passage from the report for 1920 of the President of Yale. After referring to the financial difficulties of the preceding year, he said:

"But neither the growth of funds nor the increase of tuition fees has been sufficient to meet the entire added expense, and had it not been for the Alumni Fund Organization, Yale would have found it hard to raise its professors' salaries without facing a deficit of between \$400,000 and \$500,000 on last year's current account. The response of the Alumni to our emergency call was gratifying in the extreme, and the record total of 1918-1919 which was subscribed to wipe out a war deficit was fully equalled in 1919-20. Gifts for principal amounted to \$102,000; bequests, \$63,000; gifts to income, \$400,000; interest on principal, \$70,000. Total through the Alumni for the year, \$635,000. That is what the Yale Alumni Association did last year."

At Harvard University a campaign has been carried on by its graduates for several months to raise an endowment fund of ten million dollars.

In the deed of gift of this fund it is stipulated that one-fifth of the net annual income from unrestricted contributions to the fund, but not more than ten thousand dollars in each year, shall be used for the following purpose:

"To advance the interests of the University and enable it more effectively to carry on its work by *organizing the Alumni* and keeping them closely in touch with the aims, needs and activities of the University."

We cannot yet do such things. Our Alumni are for the most part people of modest means. But who shall say what in 15 or 25 years from now will be the capacity of our Alumni for service to the University and to the country, provided only that their interest in the Association and in the University is developed and maintained, as I am sure it can be.

But as the Alumni Association is asking no increased financial assistance, you will naturally ask, "How is the duty with which this Commission is charged connected with the development of that Association or its ideals?" Briefly thus. As a foundation for the successful development and maintenance of the Alumni Association of the University as well as for the practical operation of the Publicity Bureau, there must be created, perfected and maintained a complete series of files of all the living alumni, with their correct postal addresses so arranged as a working system that the information which it contains is accurate, up-to-date and promptly available. Such a record should form a recognized bureau of the University. In a fashion such a record exists, but I am not using hyperbolic language when I say it is defective, inaccurate and inefficient for the purposes I have indicated.

In saying that I am not criticizing the past efforts of the Registrar's Office. So far as I am aware everything is done that can be done in the Registrar's Office with his present staff and facilities, but the result is none the less lamentable.

Let me give you some facts.

(a) Two years ago, when our Association undertook to raise a War Memorial Fund among the Alumni of the University, it was found that a correct mailing list was not available. We engaged a staff of typists and sent lists for corrections to all parts of the world where our members were resident. Many of these lists came back completely changed. Often men who were on the lists as alive had been dead for several years.

After several weeks' work and the expenditure of over \$7,000, we had a list of some 18,000 supposedly correct addresses; but when we had sent out our appeals many hundreds were returned on account of incorrect addresses. This experience has been repeated on every occasion that we have sent general letters to our members.

(b) According to the present files there are 1,500 Alumni who are completely lost.

In addition to these there are some 5,000 whose only available addresses are those which were given as home addresses when attending the University. This means that of the 25,000 living Alumni the whereabouts of at least 6,500 is unknown. The work done for the War Memorial was by no means sufficient to perfect the files, and since that work ceased it has been impossible, from lack of clerks, to keep the files up to the standard to which they were then brought. Owing to changes in address and the accumulation of clippings, the files are, I am informed, going backward, and this without fault on the part of those in charge.

So far as I have been able to ascertain there are no geographical files. I have for two years been asking for lists of our Alumni by counties, but have been unable to secure such lists. The lists by classes are defective in addresses and often in other respects. At present the lack of a complete and effective file record greatly hampers the efforts both of the Association and of the Publicity Bureau. We are of opinion that the early completion and maintenance of a complete and effective file record is an essential pre-requisite to the establishment of ready communication by the University with the Alumni, and a condition precedent to the success of the Publicity Bureau and the Alumni Association.

Let me summarize my point. The Alumni Association and the Publicity Bureau are now important adjuncts to the influence and work of the University. In future they will be even more important.

Their effectiveness depends in large degree on the facilities afforded by the University records for ready communication with every alumnus. At present these records do not afford proper facilities for communication.

To establish and maintain these facilities it is necessary in our opinion to establish and maintain a branch of the Registrar's office exclusively devoted to that work, and to the forwarding of communications to the Alumni.

Such a bureau can most effectively be established in conjunction with the Alumni Association and the Publicity Bureau, as these bureaux will naturally collaborate and will continually be of mutual assistance to each other.

To properly complete and equip such a file record and to provide the staff necessary to put and keep the records in effective condition will require not less than \$10,000 per year for two or three years. When the records are in proper shape a less annual sum should suffice.

These three bureaux, viz., Publicity, the Alumni Association, and the File Records, form a special group of activities devoted not to the academic work of the University, but to spreading among the public of this Province, and more especially among its Alumni, a knowledge of its present development, its work and its needs and in developing and maintaining in both these bodies an intelligent and sympathetic interest in its affairs. That work lies at the root of future progress and development, for no matter what individual Ministers of the Crown, or even a majority of them, may know or think, they can go no further than is warranted by the sentiment of the public. To inform the public of the facts and to stimulate their interest; in other words, to break down the isolation which has been the bane of the Provincial University, is the object for which these three bureaux are necessary.

BUREAU OF APPOINTMENTS.

In the Report of the University Commission of 1906 some reference is made to the establishment of a bureau charged with the duty of assisting undergraduates to secure employment during the vacation in cases where such employment is needed or desired.

So far as I am aware no action has been taken by the University in that regard, but the Alumni Association has done some work on that line. I attach as an appendix to this memorandum a statement regarding it which appeared last Spring in the University Monthly: "Similar bureaux have been found useful in American Universities. At Harvard University, for example, the average number of men who use the Student Employment Bureau to get work each year is over one thousand. It is estimated that more than one thousand other men find summer work or work during college terms on their own initiative. Thus more than forty per cent. of the Harvard student body is, in part at least, self-supporting." Judging from our experience at least fifty per cent. of the students attending Toronto University are self-supporting, and would appreciate the services of such a bureau. It cannot be doubted that the establishment of such a bureau would be welcomed both by undergraduates and by graduates, and we, therefore, invite your consideration of the matter.

BOARD OF GOVERNORS.

Finally, under the third clause of your Commission, we present one other matter. The Alumni recognize that it is essential that the members of the Board of Governors should be appointed by the Government of the Province, but they suggest that a certain proportion of the Board might well be appointed by the Government on the nomination of the Alumni, such nominations to result from the election of such nominees by the body of the Alumni. The great advantage to be derived from such a course of procedure would be that it would give to the Alumni a voice in the administration of the University, and would thus tend to stimulate the interest of the Alumni in its affairs. Also it would be likely to result in the appointment as Governors of men deeply interested in the affairs of the University, men able and willing to give time and effort to the duties of their position. For these reasons the Alumni trust that your Commission may see its way to approve of this suggestion and to embody in your report a recommendation accordingly.

All of which is respectfully submitted for the Alumni Association of the University of Toronto.

C. E. MASTEN,
President.

ANGUS MACMURCHY.
JOHN J. GIBSON,
JOHN R. BONE,
J. P. McMURRICH,
D. B. GILLIES,
HELEN DAFOE,
EVELYN McDONALD,
C. E. MACDONALD,
G. E. WILSON,
C. S. MACINNES,
W. C. JAMES,

Members, Board of Directors.

Toronto, Canada: Monday, December 6th, 1920.

A BUREAU OF APPOINTMENTS FOR THE UNIVERSITY.

(Extract from the University of Toronto Monthly.)

In February, 1919, the Alumni Bureau of Appointments was organized to assist demobilized graduates and undergraduates in securing suitable employment. The Bureau operated for four months and was then discontinued, as the urgency of the original need had ceased and as the Alumni office did not have sufficient staff to carry on the work. The Bureau, however, was established again this spring as an emergency measure to assist returned soldier-students, many of whom have already received assistance from the Alumni Scholarship Board in securing lucrative employment for the summer months. The final statistics of this work are not available, but it is estimated that approximately 150 students will secure work through the medium of the Bureau.

The Alumni Board of Directors has considered the establishment of a bureau of appointments which would concern itself not only with returned soldiers, but with all graduates and undergraduates of the University who wish assistance in securing employment. The great difficulty in the way of organizing such a bureau under the Alumni is lack of funds.

To administer a bureau of appointments satisfactorily calls for a degree of system and attention to detail that is surprising to anyone not familiar with the work. Applicants must be enrolled, correspondence carried on, with a number of references for each candidate, all material must be indexed so as to be ready for easy manipulation, one or more personal conferences must be held with each applicant, and reports and records must be compiled. Over and above all this, an organization must be set up which will bring to the office immediate information of employment openings. All of which means that a considerable staff is necessary to carry on the work.

A comprehensive University Bureau of Appointments would, however, fully repay in service the financial outlay involved. Its work would have many ramifications, but would probably be centred in the following activities:

1. Collecting data on professional and business opportunities which would serve as a vocational guide to undergraduates, providing them with a ready means of ascertaining the needs and advantages of the various callings and occupations.
2. Assisting graduates in securing employment suited to their inclinations and training.

3. Assisting undergraduates in securing vacation employment and part-time employment during the academic year in cases where financial conditions demand it.

The question of how a University Employment Bureau should be maintained and under whose supervision it should operate is an open one. In practically all of the large Universities of Great Britain and the United States bureaux are maintained by the Universities themselves. In some cases, as in the case of Harvard, the Alumni Association co-operates with the University in carrying on the work. In a few isolated cases bureaux are maintained independently by Alumni Associations. The bureau at McGill University is an example of this latter.

An appointment bureau under an Alumni Association possesses one great advantage, namely, that through local Alumni committees and individual Alumni many employment openings may be secured. On the other hand, it may be fairly argued that the final responsibility for a bureau of appointments rests with the University itself. The first duty of a University is to provide means of education through courses of instruction; but a further obligation rests upon her—the obligation to aid those who have received her instruction in securing positions in which their training will be of the greatest value to themselves and the State.

There is a movement to-day among the University men and women of Canada toward a wider field of activity. University-trained citizens are playing a greater part in the nation's affairs than ever before. In furthering this movement a well-organized University Bureau of Appointments would not only be of great service to the individuals concerned, but would be a national asset as well.

MR. CHAIRMAN, MEMBERS OF THE COMMISSION:

The Alumnae Association of University College begs to place before the Commission certain facts regarding the conditions under which women are attending University College.

As you, Mr. Chairman, of course know, University College is the successor to the University of King's College, in its origin an Anglican denominational foundation, but completely secularized by Act of the Provincial Legislature in 1849, and since then dependent, except for students' fees, upon the state for maintenance. University College, as the Faculty of Arts of the University, was originally the whole University and received the whole of the financial aid granted by the state. Gradually, however, with the expansion of the University, the College has become only part of a great whole, and now receives only $8\frac{1}{2}$ per cent. of the funds expended by the Board of Governors. University College is, therefore, the special charge of the Provincial Government, and there is no other body but the Board of Governors responsible for caring for her financially, and she finds herself to-day in the position of a very shabbily treated step-child. This is apparently inevitable, as the Board of Governors have the full responsibility of the whole University, and the part has been swallowed up in the whole.

Now, gentlemen, bad as we all know the general situation to be in University College, the present conditions are specially hard on the women. The College was planned for men only, women were subsequently allowed to slip in, and now constitute practically half the enrolment in the College. For them no proper facilities have ever been provided, anything that is done being always in the nature of a makeshift, and we submit that the time has now come when this policy should be abandoned and the policy adopted of women's residential and recreational buildings for women students. The policy of makeshifts has, of course, resulted in entirely inadequate accommodation and equipment for the proper cultural development of the women while in College, and to this, sir, I believe that the authorities of the University will assent almost as readily as the undergraduates themselves.

You, gentlemen, are no doubt aware that there is a very rapidly increasing tendency among women of all classes in the Province to seek a means of earning their livelihood, and to this end a University education is deemed important, if not essential. As one of the applicants at the residence this autumn put it: "A girl can't do very much to-day without a university education." Now, too, the Department of Education insists that all High School teachers shall be University graduates, thus not only raising the standard, but again increasing the number who will be coming up to College, whereas the increasingly bad living conditions are undoubtedly reducing the standard of an all-round education which the College is able to offer.

There are at present 492 women students enrolled in University College. Of these 250 come from outside Toronto. Of these again 150 are accommodated in the five houses belonging to the University, and 100 in boarding and lodging houses.

In this connection we wish to point out that at St. Hilda's College all students whose homes are not in the city must live in residence, eliminating for them the distressing boarding house problem; and Victoria College is aiming at the same condition, the authorities of the College considering it of sufficient importance to make a point of accommodating all their women students in College buildings as soon as possible.

Thus, gentlemen, the denominational colleges provide infinitely better accommodation for their women students than the State College. We should also like to point out, sir, that all the residential accommodation provided thus far for University College women has been obtained by pressure brought to bear by the Alumnae of the College.

Your petitioners have drawn up a certain minimum standard of living, which is as follows:—

1. Room and board in the same house or in close proximity.
2. Preferably one, and not more than two, students in one room.
3. Furniture: Single beds, study table, chair, good desk light.
4. Bathroom accommodation: Not more than five women to one bathroom.
5. The student should not be preparing her meals in her own room.
6. The student should not be living in a house where men live either as boarders or members of the family.

7. The student should have sitting-room accommodation for receiving visitors.

We have ascertained that this minimum accommodation with meals cannot be obtained in Toronto, near the University, for less than \$9.50 a week, the price charged by the University.

The figures which we are using to show under what conditions the women are actually living have been ascertained through a questionnaire sent out to those living in boarding or rooming houses this term. They show that in one respect or another most of these students are living below our minimum standard. To take the points in order:—

1. 26 per cent. have their meals and room in the same house; 74 per cent. have not their meals and room in the same house.

2 and 3. 32 per cent. live in single rooms, 57 per cent. in double rooms, 11 per cent. three in one room and 51 per cent. in double beds. In addition there are 45 of the 150 women in residence living three in one room.

4. With regard to bathrooms. I beg to refer you to Appendix B, but I wish to call your attention to the fact that the bathrooms here referred to have almost always the three fixtures in one room, and that only 9 per cent. of the women have washstands in their rooms. Also, that in boarding houses all the people in the house have to be ready for breakfast at the same time, creating a situation described by one of the students as follows: "I felt myself lucky if I could get one hot bath a week. In no one boarding house was there more than one wash-basin or bath. This, coupled with the fact that there were anywhere from fifteen to twenty roomers, made it difficult to wash properly in the morning, or indeed at any other time."

5. A few students are preparing their meals in their own rooms.

6. Forty-six per cent. are living in houses where the sexes are mixed. The objection to this is illustrated by the following incident: This term a group of undergraduates took rooms together in one boarding house, taking the precaution of renting the parlor also, and believing that they had thus secured the whole house. One evening they required a knife from the dining-room. One girl went down to get it, and was just about to turn on the light when an unusual sound made her look round; and by the light from the hall she could see that a man was sleeping on a cot in the room. This and other improper conditions led to the whole group being obliged to move from the house.

7. Sitting-rooms. In 42 per cent. of cases there are no sitting-rooms, and in 58 per cent. the use of the sitting-room is allowed, but often with great restrictions, the result being that it is becoming an all too frequent habit for the women to receive men visitors in their bedrooms—a matter of very grave concern to those in charge of the women and, I may add also, to the members of the staff in the University. See Appendix A.

Your petitioners consider that with students in rooms one of the most serious aspects develops in the event of illness. Last year one student died whose life might have been saved if she had gone to bed sooner and not been obliged to go out for meals. One student was left for twenty-four hours without food or attention before her friends found her. On one occasion, when the head of the Women's Union went to see her, she found the girl lying in bed and a male undergraduate making up her fire, he having been commissioned to do so by the landlady.

Cleanliness is another very difficult point. Clean linen is very often difficult to get, and two different groups of students have had to leave houses on account of vermin.

The moral aspect of the rooming house problem is the most serious one. We have touched on it already under several headings, the greatest danger being in mixed rooming houses and in places where the students have no sitting-room. An occurrence in a mixed rooming house may be cited: A student said that her landlady went away for one week-end, leaving men roomers on the first floor and women roomers on the second. The men turned the girls' beds upside down, hid their things and greased the banis-

ters. This seems like a frivolous episode at first sight, but one can readily see where such things might lead, and we feel that the Government is taking upon itself a very heavy responsibility in allowing the possibility of such a state of affairs to continue.

We have shown, Mr. Chairman, that the accommodation available near the University is very undesirable for the women students, but, bad as it is, it is becoming each year increasingly difficult to find at all. Several cases have come to our knowledge of women desiring to enter University College who have had to give up the University altogether, or who have gone to other colleges on account of their inability to obtain proper living quarters near the University. This is partly due to the inroad of the foreign population into the district, which was formerly of a very high character. Great overcrowding and lack of cleanliness are one of the results of this development and a general lowering of the tone of the district. Five times in two months examples of indecent behaviour and attempted assault have been reported to the police. Last year a student took rooms in a house on Huron Street, near Bloor, which turned out to be a house of ill-fame and was reported to the police. In fact, to quote a fourth-year student: "Living in a rooming house is a miserable existence."

We consider, Sir, that even for women living in residence the conditions are highly unfavourable to their proper development for going out through the Province to help shape its future. They are living in houses scattered all over the University property, and there is no possibility of a corporate life or the formation of an *esprit de corps* among the women. The various sections have this spirit, but it merely tends to break up the College life and make factions, instead of blending them into a unified body. This has always been felt as a serious disadvantage to University College in inter-college contests, whether on the athletic field or in the debating society. There is no meeting place for the 492 women now in college. The University College Women's Union, which is the only place where meetings can be held, is very greatly overcrowded. Yet, there being no place at all where mixed organizations such as a year executive or departmental societies can meet in the College, the Union must needs open its doors to these also.

The women have, as a rule, no place for study outside their bedrooms, and in four out of five of the residences there is no dining-room, and the students have to go to another building for their meals. This is particularly serious in the case of 100 Queen's Park, as the students must cross the park at night in order to reach the Union.

The needs we have enumerated, Mr. Chairman, are so striking that those cognizant of conditions, the women graduates and undergraduates, took the matter up and concluded that the only solution for this state of affairs lay in new buildings. On the assurance of the Board of Governors that though the need was very apparent there were no funds which could immediately be applied for this purpose, the women graduates of the College inaugurated a movement to secure funds, and have themselves subscribed in the past six months \$25,000, the undergraduates contributing \$6,000 of this amount, and we hope for a much larger amount before the fund is closed. And, Mr. Chairman, if, as Judge Masten has just said, the alumni are of moderate means, the alumnae may be called poor.

Owing to the general financial depression the appeal to the public, upon which we depended for the major portion of the amount necessary, has had to be indefinitely postponed. We therefore appeal very strongly to the Government of the Province that they consider at the earliest possible moment providing the buildings necessary for the proper accommodation of the women in University College.

All of which is respectfully submitted.

EDITH E. HENDERSON,
Chairman of the Buildings Committee.

EVELYN McDONALD,
President, University College
Alumnae Association.

APPENDIX III

STATEMENT OF UNIVERSITY COLLEGE ALUMNAE ASSOCIATION,
UNIVERSITY OF TORONTO

APPENDIX A.

Report re Rooming Houses, University College.

1. 1920-21. Total number of women in College, 492; total number of women living at home, 242; total number of women in residence, 150; total number of women in rooms, 100.

2. *Not a good district for rooms.* (a) Crowded. (b) It is never safe to look for rooms south of College Street. (c) Have reported to the police indecent behaviour and attempted assault to women students by men in Park, St. George Street, etc., five times in two months. There are other cases not reported. This shows the danger of going to their rooms from dinner. (d) 1919-20 one woman student took a room in a house in Huron Street, near Bloor Street. The house was found to be a house of ill-fame and was reported to the police.

3. *Cleanliness Difficult.* (a) 1919-21, two cases of groups of students having to leave houses because of vermin. (b) Scarcity of bathrooms; see table, Appendix B. (c) Hot water; see Appendix B.

4. *Sex of Roomers.* Seventy-eight reported—42 female only, 38 mixed. This in houses without proper sitting-room accommodation and without adequate number of bathrooms. A complaint has been made already this term about women students entertaining men in bedrooms. One student said that the men rooming in her house were very thoughtful, because they whistled when they came upstairs past the bathroom door.

5. *Crowding in Rooms.* (a) In 80 students' rooms there are 41 double beds and 39 single, therefore the standard is very bad. There are 26 single and 46 double rooms in 81 houses, and nine where three are living in one room. In the University College residences there are 14 rooms with three students—a very bad standard especially in residence. Many students never have the opportunity of being alone. (b) Illness, crowding in the rooms and no meals in the majority of houses make a serious problem. The crowding in rooms becomes an actual menace during anything resembling an epidemic, as it is almost impossible to prevent the disease from spreading to all occupants.

6. *Constant Moving.* Eighteen moved from one to five times in first two months of this term. In four years one student moved ten times, one moved five times. It is very seldom that a student is in the same room for two years running.

Extracts from questionnaires: "Living in rooms is unsatisfactory and unhealthy"; "very inconvenient to room and board in different places"; "very difficult to get rooms." A student in the fourth year writes: "Living in an ordinary rooming house is a miserable existence."

Present conditions are injurious to health, decent standards and sound education. We believe it would be more in the interests of the whole Province that these students should not come to College at all than live as many of them are doing.

APPENDIX B.

Single Rooms. 26=32%.	Double Rooms. 46=57%.	Three in Room. 9=11%.	Total. 81 Houses.
<i>Beds.</i>			
Single. 39=49%.	Double. 41=51%.		Total. 80 Houses.
<i>Sitting-room Accommodation.</i> (Often Restricted Use.) 45=58%.	None. 32=42%.		Total. 77 Houses.
<i>Sex of Roomers.</i>			
Female Only. 42=54%.	Mixed. 36=46%.		Total. 78 Houses.

Meals.

Meals in same house as			
Rooms.	In another House.	Total.	
21=26%.	59=74%.	80 Houses.	

Bathrooms. 71 reports.

Houses.	People.	Baths.	Houses	People.	Baths.
15=21%	39	19	56=79%	244	65
=5 people or less to one bath.			=more than 5 to one bath.		
Houses.	People.	Baths.	Houses	People.	Baths.
44=62%	139	53	27=17%	144	30
=8 people or less to one bath.			=over 8 people to one bath.		

Washstands in Rooms. 65 Houses.

With Washstands in Rooms.	No Washstands.
6=9%	91%

Hot Water.

Good, 38%; fair, 32%; poor, 16%; available only when ordered, 14%.

APPENDIX IV

STATEMENT OF ENGINEERING ALUMNI ASSOCIATION,
UNIVERSITY OF TORONTO

DR. H. J. CODY,

TORONTO, December 6th, 1920.

Chairman, Ontario Royal Commission on University Affairs, Toronto, Ontario.

HONOURABLE SIR,—The Engineering Alumni Association of the Faculty of Applied Science and Engineering of the University of Toronto desires to place before you some of its views and certain recommendations, believing these will be of interest to you at this time.

ORGANIZATION—THE ENGINEERING ALUMNI ASSOCIATION.

That you may be informed in regard to the Association which is now addressing you, we would advise that it includes not only the two thousand (approximately) graduates of the "School," but all others who have completed at least two years at the "School," and whose year has been graduated. It has been impossible, of course, to communicate with this large number of men, but the statements which we are herein making have been discussed by the Council of the Association and are given to you as their well-considered opinions.

That you may further understand the calibre of the members of our Association, we would advise you that they have occupied, and do occupy many very responsible positions. A very partial list is given in "Schedule A" appended hereto.

That you may still further understand the composition of our Association, we would refer to the geographical distribution of the two thousand men who have passed through the "School." This distribution is shown in graph appended, marked "Schedule C." Worked out in percentages it shows that of the nineteen hundred and seventy-six men who are still living, 89% are resident in Canada, 73% are resident in Ontario, and over 35% are resident in Toronto.

A third graph, marked "Schedule D," shows the percentage of graduates of the "School" employed in various years in Canada. The graph illustrates very definitely the fact that Canada has always absorbed the majority of our members, and that that absorption is at a maximum to-day. These schedules show very conclusively that the large majority of the men trained in the "School" are applying their training in Canada, and particularly in Ontario and Toronto. We believe, consequently, that you will be interested in having their viewpoint laid before you.

BRANCHES.

Branches of the Association have for some time been established in Toronto, Montreal, Ottawa and on the Pacific Coast; one has recently been organized in Sudbury, and it is expected that branches will shortly be established in the districts centring around Hamilton, Niagara, Windsor, Winnipeg, Regina, Calgary, Edmonton, New York, Pittsburgh and Chicago.

AIMS AND OBJECTS.

The aims and objects of this Association are to promote the continued welfare of the Faculty of Applied Science and Engineering and of the University, and to be in active co-operation with them; to stimulate education generally and engineering education in particular, and to develop and maintain in our membership high ideals of professional honour and citizenship.

Buildings and Equipment.

The "School" is, we believe, recognized as the Provincial institution of engineering learning. To maintain it in the premier position which it has and must occupy, it will be necessary that large capital expenditures be made in the not distant future for new buildings and equipment, and provision should be made shortly to replace the old "School" by a modern structure.

Salaries.

While the physical side of this subject is most important and must certainly be properly taken care of if satisfactory results are to obtain, it is still more important that the personnel of the teaching staff of the Faculty should be maintained at the highest possible standard. The Faculty has been fortunate in drawing to it men of outstanding ability and character, but it cannot, we believe, hope to retain this type unless adequate remuneration is provided. At the present time it is unquestionably a fact, due in some measure to the unusual economic conditions which have prevailed during the past few years, although not entirely, that our scale of salaries is low, so that in a large measure the personnel of the staff could obtain considerably larger compensation in industrial or commercial work. We trust, therefore, that this very important matter will receive at your hands the consideration and sympathy which it requires.

Cost of Training Engineers Warranted.

We realize that the cost of training Engineers is relatively high compared with the cost in some of the other Faculties, but we submit that in the same degree that the recent Great War was termed an "An Engineer's War," we are now involved in an Engineer's peace. In this great country, with its vast natural resources, which form the very basis of our prosperity, the Engineer is essential for their development, and whatever moneys have to be spent on their education will be repaid abundantly.

Board of Governors.

No body of men is more interested in our University than those belonging to this Association, nor, we believe, is any group of men better qualified to assist in solving University problems. We believe, therefore, that it would be an advantage to the University if our Association could be represented on the Board of Governors. Such a representative, we believe, would be invaluable where matters pertaining to housing, equipment and staff are being considered.

Senate.

Under the present University Act the Faculty of Applied Science and Engineering is limited to two members on the Senate. We believe that this should be increased to four at least, and we ask your consideration of this suggestion.

Faculty Council.

We also believe that we could be of direct benefit to the Faculty if a closer co-operation were maintained between the Faculty Council and our Association, and we would suggest that consideration be given to this matter.

Research.

We have mentioned that engineering is playing, and must continue to play, an even greater part in the vigorous life of this great country. Engineers are being employed in industrial activities in ever-increasing numbers, and research work is being developed very rapidly. In order to maintain our position in the country's affairs and to work out our proper destiny, more adequate facilities should be provided at the "School" for this important work.

Diploma Men.

It has, unfortunately, long been a cause of considerable feeling that men who have completed the regular three-year course at the "School" have not been given the standing of graduates of the University. These men took the regular course in force at the time they passed through the "School," and many of them are now occupying very high positions. We would earnestly ask that degree standing be accorded these men, and that they be added to the roll of the Alumni of the University of Toronto.

In conclusion, we would assure you of our very deep interest in all matters affecting the University of Toronto, and particularly the Faculty of Applied Science and Engineering, and therefore hope that you may find it possible to concur in the views which we have set forth.

Yours respectfully,

COUNCIL OF THE ENGINEERING ALUMNI ASSOCIATION,

WM. A. BUCKE,

1st Vice-President.

C. E. MACDONALD,

Secretary.

SCHEDULE "A."

Chief Engineer, Canadian Pacific Railway. (This is the second time this very important position has been held by one of our members.)

Chief Engineer, Nova Scotia Power Commission.

Vice-President and Chief Engineer, Dominion Bridge Company.

Commissioner for Montreal.

President, Manitoba Bridge and Iron Works.

Assistant to President, International Nickel Company of Canada. (Formerly Chief Engineer.)

President, Manitoba Steel and Iron Company.

General Manager and Chief Engineer, Toronto Harbour Commission.

Chief Engineer, Bell Telephone Company of Canada.

Deputy Minister of Public Works, Alberta.

Director of Water Powers Branch, Department of Interior.

Metallurgical Engineer, National Tube Company.

Chief Engineer, Hydro-Electric Power Commission of Ontario.

Electrical Engineer, Hydro-Electric Power Commission of Ontario.

Hydraulic Engineer, Hydro-Electric Power Commission of Ontario.

In addition to the above, there are a large number of prominent Consulting Engineers, Chief Engineers, Assistant Engineers and Executives. That you may have a quick view of the distribution of our members in reference to the positions held by them, we append a graph marked "Schedule B." This graph was made up for the year 1914. Time has not permitted bringing it up to date, but it may be considered, we believe, representative of present-day conditions.

Schedule B

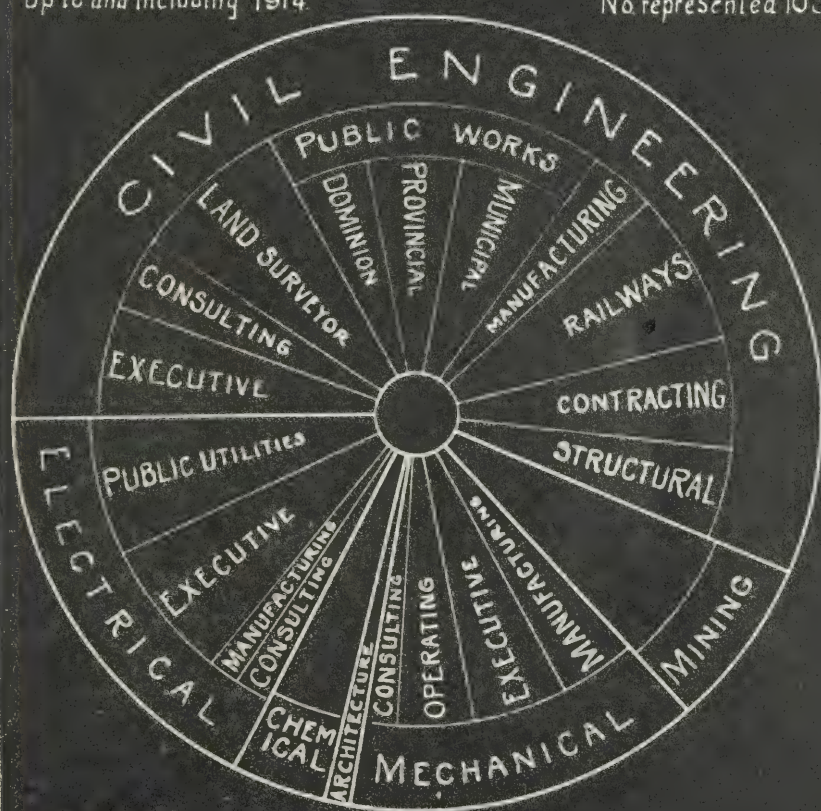
UNIVERSITY OF TORONTO

POSITIONS HELD BY

GRADUATES IN VARIOUS BRANCHES OF ENGINEERING.

Up to and including 1914.

No. represented 1030



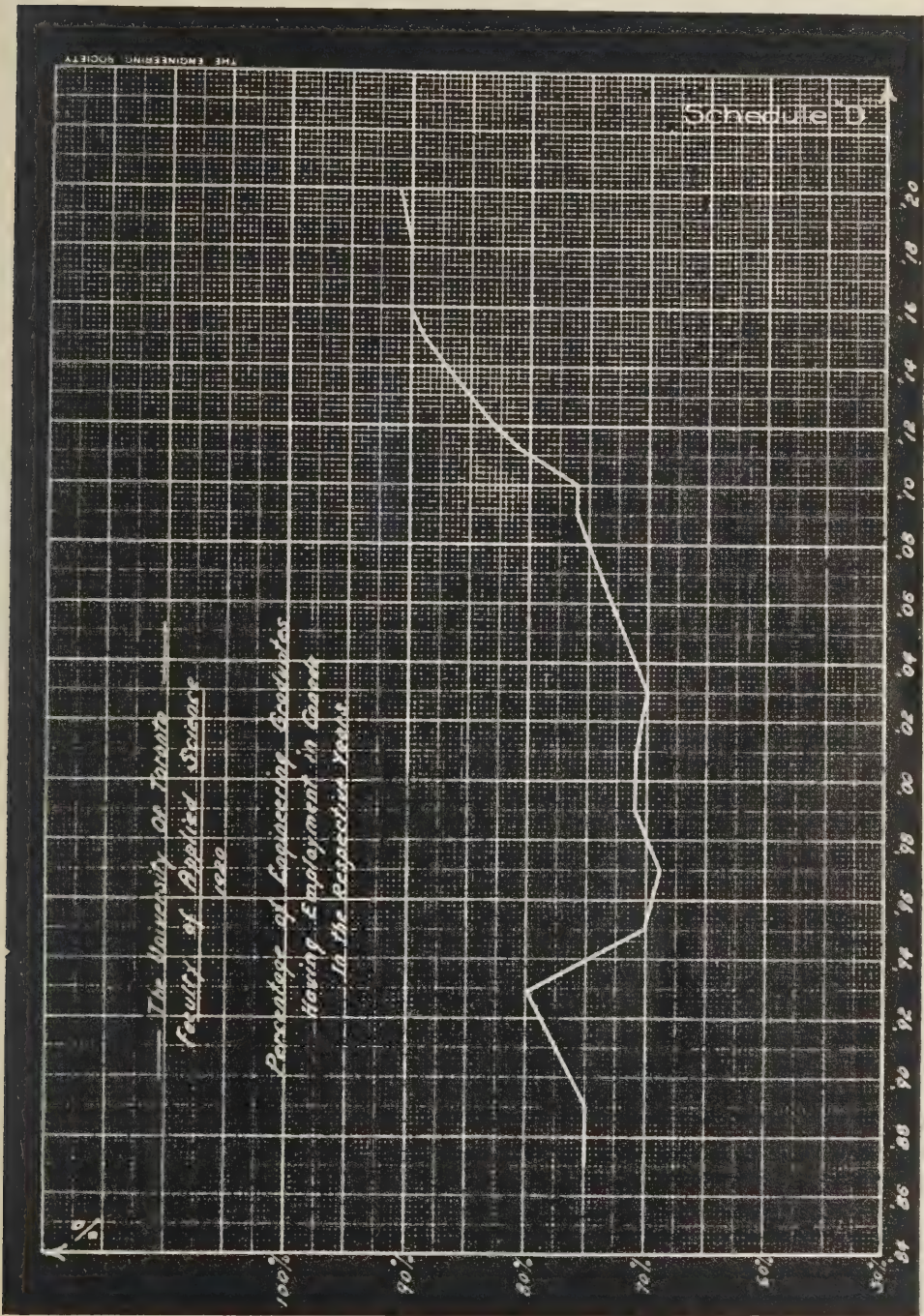
Dec. 1920

Schedule "C"

UNIVERSITY OF TORONTO
DISTRIBUTION OF
GRADUATES IN ENGINEERING
In Year 1920
Number Represented 2040



Dec. 1920



APPENDIX V

STATEMENT OF PROFESSOR ALEXANDER

MEMORANDUM.

1. As the result of a number of informal meetings and discussions several members of the teaching staff in the University of Toronto desire to emphasize certain aspects of academic work to which the Commission may not have given the attention that their importance justifies.

2. The most important point for the welfare of the University as a whole is the provision of a staff adequate to the demands.

(a) The demands made upon individual teachers at present are abnormal, in that the junior men do not get opportunities to develop into teachers equipped for the higher positions; that the senior men are heavily handicapped by the amount of elementary work they must undertake, and that in all grades there is an increasing lack of opportunity to give individual students an adequate amount of personal attention.

(b) The development of research work in its relation to graduate instruction is intimately connected with the points raised in the preceding paragraph. At present such research work cannot be adequately done. Graduate work should, as a rule, be intimately associated with the regular work of teaching, therefore development of the former necessitates further increase in the teaching staff. No instructor should be required to give more than a limited number of hours to class teaching, or to instructing individually more than a limited number of students.

(c) Securing a staff is inevitably connected with the question of remuneration and conditions of work. Where the salary is adequate, the conditions in this University are usually such as to prevent it from getting the best men. Junior men, being overloaded with routine work, cannot successfully show their fitness for promotion. If they are continued as mere instructors till their length of service gives them a claim to promotion, the conditions of that service prevent them from showing, by literary or scientific production, whether they will ultimately be fit for the higher positions. The persistence of these conditions will ultimately cause insuperable difficulties, as it leaves the University with a supply of teachers who must be superseded when making appointments to the highest posts.

(d) The most serious problem confronting Universities to-day is to find suitable instructors. This difficulty arises because the University has to compete with the attractions of non-academic employments in this country, and even when the field is extended to other countries the problem remains very acute. The close relation in this matter of appointments between Canada, Great Britain and the United States makes the question of salary almost an international one, both as regards attracting men from elsewhere or retaining those engaged in this type of work. In all countries it is becoming increasingly difficult to persuade those University graduates who are best fitted for the work to enter on academic careers, because the financial return is not sufficient.

APPENDIX VI

REPORT OF TRUSTEES OF QUEEN'S UNIVERSITY

I. General Grounds on which assistance is urged, from private and public sources, for the Universities of Ontario.

(a) *From the national point of view the importance of university work is becoming more and more manifest.*

The field of knowledge is extending in every direction. In science the trained man is required, whether it be to discover the riches of the mineral wealth of Canada or to improve and develop the methods of industry. The health of the people, which is the most valuable of all forms of wealth, is dependent to a large extent on the discoveries and application of preventive medicine. More and more important becomes the systematic study of the economic problems which beset us.* Our great war debt, the intensity of national competition, the urgency of new social difficulties, and the new place and the new responsibilities that Canada is assuming in the world, compel us to make the most of our human and material resources. We have no longer half an unmortgaged continent to play with. Behind all these specialized forms of study there is the search after knowledge where the end sought is simply the extension of the kingdom of learning in the confidence that each new fact will in the long run increase the power of man.

(b) *Increase in number of students and range of activities.*

The tendency toward increase in numbers was plain enough before the war, but since the war the rush into the universities has constituted a veritable problem. In the Province of Ontario the number of candidates for matriculation was, in 1918, 2,516; in 1919, 4,146; in 1920, 5,291. In three years the number of candidates has more than doubled. The similar experience of the United Kingdom and the United States shows that this is not an isolated or temporary development. The increase in attendance at secondary schools is part of the same movement. The growing demand of the community for a wider range of activity upon the part of the universities, with the increased readiness of the universities to respond to these demands, is another factor making for permanent increase in number. The recent action of the Province of Ontario, in conformity with progressive legislation elsewhere, in raising gradually the age of compulsory school attendance to sixteen, will probably still further increase university numbers by bringing a larger number of boys and girls to the standards required for entrance.

(c) *Inadequacy of existing university resources.*

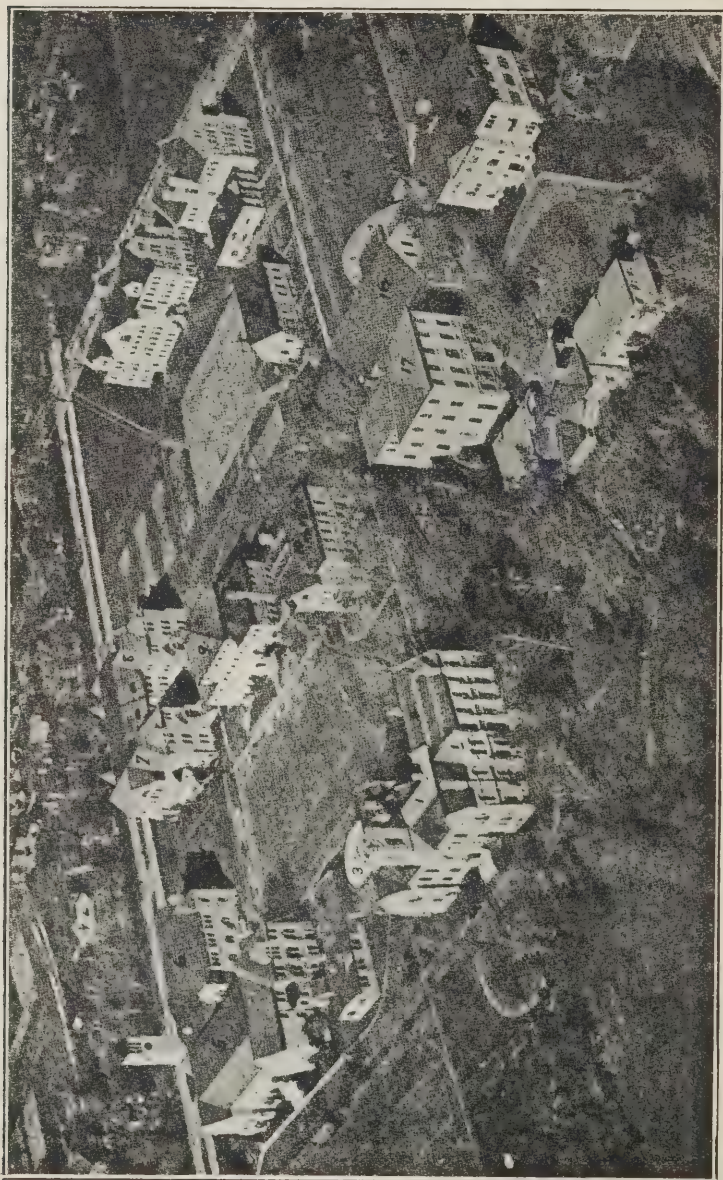
It is unfortunate that this great increase in the number of those anxious to have university training should have coincided with the period of great rise in prices. The cost of administration has increased enormously. Revenues from fees, endowment or public grants go only half as far in providing the buildings or the equipment needed, and do not permit adequate payment for instruction.

(d) *The interests of higher education and of primary and secondary education are vitally interdependent.*

The interests of the universities and of the schools are largely identical. The universities cannot work effectively unless their students have been well trained in the schools, and the effectiveness of the schools depends in large part on the quality and training of the university graduates who staff them or train their teachers, and on the success of the universities in helping to maintain ideals and an atmosphere favourable to education.

(e) *Public recognition of the need of higher education.*

There is perhaps no more significant indication of the recognition of these needs than the fact that the returned men, acting through the Advisory Committee to the Repatriation Committee of the Dominion Cabinet, urged upon that government, as the fundamental and most essential policy in reconstruction, a courageous and liberal policy of Government aid to education, and particularly higher education. At their instance a conference of the Universities of Canada was called, and met in Ottawa in 1919. This action was strongly endorsed by the Trades and Labour Congress.



II. Grounds for considering that a large proportion of this support should come from public sources, and in particular why more aid is sought from the Province of Ontario.

(a) Private resources no longer suffice; the task is greater and increased taxation limits private liberality.

Appendix III in this statement will show the large extent to which the endowment of Queen's has been derived from private sources. For the first sixty years of its history the University existed and made itself a power through the liberality of individuals and of the Presbyterian community in Canada in general. But the University has never had behind it any wealthy constituency. The recent effort on behalf of McGill shows what may be done by a great university in a rich city which is the centre of the operation of large business corporations of national scope; but even McGill has found it necessary to secure \$1,000,000 from the Province of Quebec towards its endowment fund, as well as an annual grant. Queen's has never had such a community to appeal to. Its wealth has been drawn from a multitude of subscribers of small sums; many a ten-dollar or a hundred-dollar subscription has represented a real but an ungrudged sacrifice. Incidentally it has often given the giver a new interest in Queen's, as with the Glengarry father who counselled his freshman son: "Now see that you get good value for that ten dollars that Principal Grant got out of me for Queen's." A succession of endowment efforts has done much to knit together her graduate body in a loyalty which is wonderful, but an examination of any such subscription list will show that the assistance has come largely from professional people whose means have been limited. The task of university education has grown beyond the power of such a constituency to bear alone. And as for the men of large fortunes, the increase of taxation, both on income and on inheritance, is certain to have an effect, and not least a psychological effect, on their readiness to devote to higher education a proportion of the margin which hitherto was available for public purposes. The State now takes wealth which private liberality formerly dispensed, and consequently the University must look to the Government in an increasing degree for aid. In England, even Oxford and Cambridge, which have hitherto received no direct State aid, are now compelled to look to the Government for assistance.

We do not mean to say that universities should or are likely to slacken in the endeavor to secure needed funds from private sources. Unless their work was such as to receive such practical endorsement from the general public, they would have no right to seek Government aid. So far as Queen's is concerned, and doubtless all the other universities of Ontario, private and local aid will continue to be sought, and the revenues from fees and from endowment must continue to meet a large part of our expenditure.

(b) Every progressive country is spending an increased amount on education.

Everywhere, at least in all English-speaking countries, the same factors are at work—increased range of school and university activities, increased numbers of students, lengthened period of attendance, higher standards of instruction, higher costs of building and maintenance, and with these factors, a growing public conviction that the meeting of these needs is the most indispensable and the most fruitful of government activities. It is, therefore, not surprising to find the public outlays upon education increasing with great rapidity.*

(*) INCREASE IN PUBLIC EXPENDITURE UPON EDUCATION.

Canada—	1901	1914	1918	1920
Total public expenditure on all forms of education	\$11,751,625	\$49,246,320	\$61,533,520	.....
England and Wales (<i>London Times</i> , July 29, 1920).				
{Elementary, secondary and special)—				
Board of Education	£9,744,208	£15,245,621	.....	£45,755,567
Local rates		14,860,000	.....	31,716,717
Total		£30,105,621		£77,472,284
Total expected in "normal year"				£100,000,000

United States (Report of U.S. Commissioner of Education).				
	Public Elementary and		All Normal	All Colleges and
	Secondary Schools.		Schools.	Universities.
1870	\$63,000,000		\$202,000	\$5,000,000
1880	78,000,000		873,000	6,000,000
1890	141,000,000		2,466,000	10,802,000
1900	215,000,000		4,518,000	24,000,000
1910	426,000,000		14,000,000	78,000,000
1915	605,000,000		15,885,000	101,000,000
1920	1,015,000,000		27,000,000	182,000,000

United States (Report of U.S. Commissioner of Education).

(c) *Even so, the expenditure on education is not great as compared with the resources of the people; it is not so great as the expenditure for less essential purposes, and it does not form so large a proportion of the total federal, provincial and municipal expenditure as it did a decade ago.*

- (i) The United States Commissioner of Education estimated in 1913-14 that the United States public bill for education was—

a little less than the value of the wheat crop,
a little more than the value of the cotton crop,
less than half the value of the corn crop.

According to figures given in the Canada Year Book, the Canadian public bill for education in 1914 was—

a little more than one-third the value of the oats or hay crop,
a little more than one-fourth the value of the wheat crop.

While in 1918 it was—

less than one-fifth the value of the oats crop,
less than one-fourth the value of the hay crop,
less than one-sixth the value of the wheat crop,
practically equal to the value of the (1917) production of pulp and paper.

In 1918 the total cost of maintaining the universities of Canada (from fees, endowments, private gifts and State aid) was—

less than one-twelfth the value of the turnip crop.

- (ii) The public expenditure on education in Canada, the United States and the United Kingdom has been, and possibly is still, only a small fraction of the liquor bill. On this continent it is probably not much greater than the expenditure on moving picture shows. Canada's expenditure on higher education in 1919 was only one-third the value of the silks imported in that year. The sum required to build a single post-Jutland battleship, which must be scrapped in twenty years, would endow and maintain forever six Universities like the Queen's of to-day.

- (iii) Obviously it has not been education, but war and preparation for war, and other activities of the national or federal governments of these countries, which have chiefly swelled the taxpayer's bills. In the federal budget of the United States for the current year ninety-three cents out of every dollar are spent for past and future wars. In both Canada and the United States the proportion which expenditures for education bear to total national, provincial or state, and municipal expenditures, is not now much more than half what it was in pre-war days.

(d) *Ontario, though rightly considered one of the wealthiest and most progressive communities on this continent, has not kept pace with comparable states to the south in its provision (i) for education in general, (ii) for higher education.*

Comparing all Canada with the whole United States, we find that in 1914 the expenditure on higher education in the United States was 13.6 of the total expenditure for education, while in 1918 the total expenditure in Canada on universities was 7 per cent. of the total, and, including agricultural and theological colleges, 10 per cent.

Considering only provincial or state expenditure, we find that the Province of Ontario spent for education altogether in the fiscal year 1918:

less per capita than the great majority of comparable states, and
less than the average of all the states of the Union.

a smaller proportion of its total ordinary expenditure than the great majority of comparable states, and only two-thirds as large a share (20.3%) as the average of all the states (29%).

Comparison of Expenditure on Education by the Provincial Government of Ontario and by the Governments of certain States in the United States, Fiscal Year 1918-19.

Province or State	Population	Provincial or State Expenditure for Education	Per Capita	Total Ordinary Expenditure of Province or State	Percentage of Such Expenditure on Education
Ontario	2,760,000	\$4,366,000* approx.	\$1 58	\$21,464,000	20.3
Ohio	5,304,000	6,041,000	1 14	24,766,000	24.4
Indiana	2,849,000	5,413,000	1 90	14,229,000	31.1
Illinois	6,297,000	6,892,000	1 10	23,644,000	29.2
Michigan	3,153,000	10,842,000	3 44	28,527,000	38.1
Wisconsin	2,567,000	7,415,000	2 89	17,731,000	41.0
Minnesota	2,331,000	8,475,000	3 63	23,265,000	36.5
Iowa	2,224,000	2,930,000	1 32	12,107,000	24.2
Washington	1,644,000	4,952,000	3 01	12,309,000	40.2
California	3,164,000	11,152,000	3 52	35,566,000	31.1
Kentucky	2,415,000	4,665,000	1 93	11,749,000	39.9
All States of United States	105,082,000	184,492,000	1 75	635,370,000	29.0

As to State aid to higher education in the United States, we find:—

- (i) A steady and rapid increase in the amount of the grants.
- (ii) A steady and rapid increase in the proportion borne by the State of the total cost of maintenance.
- (iii) A steady and rapid increase in the proportion which expenditures for higher education bear to the total expenditure of the State.**
- (iv) Some tendency to substitute for the system of annual appropriations a definite share of the revenue of the state, usually in the form of a mill tax on general property, to provide maintenance, supplemented by appropriations for buildings as the need is proved.†

Indiana.

"Purdue University, Indiana University and the State Normal School (giving general Arts work) receive the proceeds of a mill tax, amounting to 7 cents on every \$100 of property assessed, which is divided on the basis of 2-5, 2-5 and 1-5 respectively. This basis of distribution has been observed for many years; it was originally agreed upon by the three institutions and incorporated in the appropriate acts."

Michigan, 1920.

"The principal support which the State of Michigan has extended to the University of Michigan during recent years is in the form of mill tax, three-eighths of a mill on each equalized dollar of valuation. For the past two or three years this has produced \$1,687,500. Previous to that for five years it produced \$1,050,000, and previous to that \$850,000. From time to time appropriations for buildings have been made. The Agricultural College also has a mill tax of one-fifth of a mill, and special appropriations are made for it from time to time for buildings."

Oregon, 1920.

"The State of Oregon, by referendum vote in the general election of 1920, voted to levy a tax of 1.26 mills on the property of the state, for the support of higher education, in addition to an existing millage tax of .74 mills. The new rate of 2 mills will provide, on an estimated valuation of \$1,000,000,000, \$2,000,000 for the maintenance of the three state-aided institutions."

* Including provincial appropriations for Ontario Agricultural College.

** Cf. Bulletin U. S. Bureau of Education, 1916, No. 26, p. 41: "Not only have State appropriations for higher education grown steadily from year to year, or from biennium to biennium, in nearly all the western and mid-western states, but the proportion of the total State appropriations which is devoted to higher education has increased steadily also."

† Cf. Biennial Survey of Educational Legislation, 1919: "In the matter of university general maintenance and current expenses, there is a tendency to increase the amounts allowed, and to stabilize support by providing for tax levies to replace the older practice of making specific appropriations by statute."

III. The grounds for considering that a substantial share of such provincial aid should be granted to Queen's University.

(a) All existing facilities in the Province are required.

The great increase in the numbers of students and in the range of university services will tax to the uttermost all the facilities for university education now available in Ontario. Even as it is, Queen's, like other universities, has found it difficult to carry on its work adequately. The difficulty has been met and largely overcome, owing in part to the co-operation of staff and students in adopting unusual lecture and laboratory hours, and in part to the excellence of our main laboratory facilities. In spite of overcrowding, no student has been compelled to accept instruction in scientific subjects without the regular amount of laboratory work.

It is fortunate that in the province there are already developed three university centres, equipped, in varying degree, with the staff, buildings, experience and traditions essential for facing this task. It is much more possible to meet the situation adequately and economically than if there were only one university to undertake it and if it were necessary to improvise double or treble facilities. Universities are not built in a day. In so far as it is possible to utilize the existing facilities of Queen's and to extend them at comparatively low cost, it would be waste of money and waste of inherited spiritual value not to do so.

(b) Centralization is undesirable in University life.

A University is a great deal more than an educational institution in any narrow sense. It is a place where the atmosphere is made by the contact of student with professor, and of the student in one faculty with the student in another. In Queen's the members of the staff have always maintained a real intimacy with the students. The most powerful influence of the teacher has frequently been exercised in his own home in most human and informal discourse. The students in the various faculties know one another. The University is the largest factor in the life of a small city, and the student has an importance and a place that cannot be his in a large city where the University itself is only one among a dozen competing interests. The affection that is borne by old students of Queen's for their University is a fact that needs no demonstration. The institution has developed a certain family type, due to the fact that for three or four years there has been this close fellowship among men of widely differing interests and outlook. A student in Columbia University, for instance, who is one among twenty-one thousand students, may learn a great deal from able men, and he may completely miss the discipline and the contact of youthful mind with youthful mind, and the stimulation of close and intimate contact with teachers to whom he is more than a number in a seat or a name in a card index. He may emerge with a degree which he might have gained almost anywhere, but he will not have the broadening of mind and the stirring of affection for the very stones of the place that a smaller institution would have yielded him.

Different types and traditions are desirable in university life. Would Scotland have gained if she had had only one university instead of four throughout the past three hundred years? There is no question that diversity contributes to the richness of national life and the effectiveness of educational experiment.

(c) Aid to Queen's does not mean "diversion" of funds from Toronto.

The University of Toronto Alumni Association has issued a public statement, couched in moderate terms, warning of the dangers of such aid to other universities as would constitute a diversion from Toronto, as the Provincial University, of the funds necessary to make it a great and adequate seat of learning.

Queen's does not wish to have this question of provincial assistance made a matter of university rivalry or of political pressure. We assume that the purpose of the Government in appointing the Commission was to make it possible to have the question decided on its merits. We believe that it is possible to find a solution consistent with the interests of the province which will be to the interest of Toronto as well as of Queen's. We have taken pride in the achievements of the University of Toronto, and hope that its progress will continue, just as we hope that Western University will find a large and growing field for effective work in its prosperous western community. We may take this opportunity to express our pleasure at the spirit of good-will and friendly co-operation which has marked the policy of the officers and staff of the University of Toronto of late years, and our belief that the effectiveness of the work of all the Universities—Toronto, McMaster, Western and Queen's—has been greatly increased as a consequence.

Provincial funds granted to Queen's do not constitute a diversion from the University of Toronto unless it can be shown that they are being used less effectively than if added to Toronto's appropriation. As a matter of fact, if funds are "diverted," work is also "diverted"; Queen's in undertaking a part of the work of higher educa-

tion in the province, and performing it at least as economically, thereby lessens the burden that would otherwise fall on Toronto's shoulders. The main question that faces the province is simply, how, given existing conditions, can we allocate our funds for higher education to produce the maximum results? Maximum results do not necessarily follow concentration, whether money costs or teaching results are considered. Queen's does not expect ever to attain Toronto's magnitude, and there are phases of university life and work more successfully achieved there than here, but we believe we also have our points of strength, and that there are forms of university work which we can do at least as successfully as any university in Canada. In so doing we are yielding the province maximum returns for any aid extended.

Queen's has not thought of proposing any change in its own formal status, much less presuming to propose any change in the formal status of the University of Toronto. It must be recognized, of course, that time and changing needs bring about changes in public policy in educational as in other affairs. There was a time in the history of Ontario when those in authority considered a certain denominational connection absolutely indispensable in a provincial university, and there came a time when those in authority cut off provincial grants to several universities simply because they had a denominational connection. There was a time when Queen's, though dedicated to the nation, belonged to a Church; there came a time when the Church relinquished all control and gave Queen's to Canada in form as well as in fact. There was a time when the University of Toronto was controlled directly by the Government; there came a time when, with good results, its control was given to an appointive Board of Governors, and there may come a time, if the present proposals of the University of Toronto Alumni are accepted, when a share in its control will be given, as at Queen's, to representatives of the graduates. There was a time when no Government grants were given to any university except the University of Toronto—and incidentally in no period was the amount which that University received so small in relation to its needs and the resources of the province as during those lean years when not a dollar was "diverted" elsewhere. There has since come a time, first under Sir Oliver Mowat, Hon. A. S. Hardy and Sir George Ross, later under Sir James Whitney and Sir William Hearst, when the province of Ontario saw fit to make substantial and increasing grants for the support of higher education, first in Kingston, and later in London, and at the same time to put the University of Toronto on a more adequate financial footing. Now a Royal Commission has been appointed to make, for the first time, a systematic study of university needs and finances. Queen's simply urges that the Government aid which has been given in the past quarter century, and particularly in recent years, should be increased and placed on a definite basis, which will enable the University authorities to do their work effectively, and make plans for some years at a time, and which will relieve the provincial authorities of the necessity of perpetual and piece-meal consideration of the question.

(d) Aid to Queen's does not involve wasteful duplication.

The question has been raised whether there exists any duplication in the activities of the universities of Ontario which could be avoided. The question is an important one. After careful consideration we have not been able to discover any duplication in the sense of unnecessary or uneconomical effort.

Duplication of the kind which should be avoided may exist when overhead costs in the shape of specialized and little-used buildings and equipment run high. But where construction and equipment costs are low, where maintenance and instruction is the main item of expense and the instructors are fully utilized, there is not duplication any more than when further instructors or additional buildings are provided at a single centre for increasing numbers. Our costs of operation are so low that it has proved as economical to carry on work in Kingston as to enlarge the accommodation at Toronto. The work of our various departments is so closely intertwined, so many departments benefit by what may be considered by-products of the work of other branches, that true economy consists in developing a well-rounded institution rather than single and isolated activities. Our departments of Chemistry, Physics, Biology, Mathematics, English, for example, give work in all three faculties, Arts, Science and Medicine, and thus ensure a very economical use of available resources.

It is not duplication, it may be added, but equal opportunity, to give the people of Eastern Ontario the same advantage of proximity to a university centre as is enjoyed by the people of Western Ontario.

While all the larger Canadian Universities, and particularly Toronto, McGill and Queen's, are national in the range of their influence and the sources of their student body, yet in these and other institutions the factor of local convenience is tremendously important. Harvard finds the great majority of its students within a hundred miles radius. Half of the women in the University of Toronto come from the City of Toronto. Twenty-two per cent of the students in attendance at Queen's this session come from

the City of Kingston and County of Frontenac, and fifty-eight per cent. from Eastern Ontario. Of course, there are limits to this principle of local convenience, but in this large and diversified province, destined to contain many millions of people, the existing centres appear to be amply justified by strategic location, local interest and historical success.

In any case the question is not whether the three faculties of Queen's should now be established, but whether a going concern should be utilized effectively.

Queen's has this past session lost one of its Faculties, the Faculty of Education, which was in intimate relationship with the whole university, and particularly with the Faculty of Arts. The work of training teachers for secondary schools is now carried on solely by the College of Education, which is virtually a Faculty of the University of Toronto. Under these circumstances we feel that if any activities are to be given up on the ground of duplication, it is certainly not Queen's that should take the next step.

(e) *Distinctive character of Queen's. Aid to Queen's means the support of an institution that is second to none in its distinctive contribution to the provincial and national life.*

Education for Students of Moderate Means.

Queen's University, partly because of its location in a small city and partly because of its early associations, has drawn to itself a particular kind of student, and has made for itself a position which is unique. It has never been the University for the rich man's son; the conditions have perhaps been too strenuous for that. But, as Appendix IX, page 64, shows, it has drawn the children of the people of comparatively small means who yet had ideals and ambition. To Queen's have come young men and women who had nothing to look to except their own brains and diligence, and the majority of the students have had to work during the college years to assist their progress financially. The result has been that the University has acquired a reputation for solid work and a certain maturity among the undergraduates; while the graduates have been a valuable national asset. The Province of Ontario, and through it the Dominion of Canada, are now in possession of a great educational plant. The University is a "going concern" which has been created very largely by the efforts of thousands of people, themselves not rich, but keenly concerned in the cause of education. In few places has the dollar been spread as far as it has in Queen's. The whole tradition of the institution has been economy and self-sacrifice. On very narrow means a great work has been done.

Large Share in the Training of Teachers.

In the educational life of the Dominion, and of the Province of Ontario in particular, the University has taken a place great out of all proportion to its size. Its graduates have found their way in unusual numbers into the teaching profession, and those teachers in their turn have sent their promising pupils forward to their old Alma Mater. Teachers and ministers have indeed been the great recruiting agents of the University, and for this reason among others the educational type has persisted. The following figures, which reappear in a somewhat different form in Appendix XIII, bear striking testimony to the educational service that Queen's is rendering the Province:

Inspectors in Ontario.

Graduates of Queen's	58
Graduates of all other Universities	49

Staffs of Collegiate Institutes in Ontario.

Graduates of Queen's	146
Graduates of seven other Universities	329

Staffs of High Schools in Ontario.

Graduates of Queen's	140
Graduates of nine other Universities	240

Staffs of Continuation Schools in Ontario.

Graduates of Queen's	37
Graduates of four other Universities	30

Initiative.

Initiative has always been characteristic of the administration, and when the small resources of the institution are taken into account the extent to which it has been able to experiment has been remarkable.

Queen's was the first university in Canada to admit women to its Medical School. The experiment was abandoned only when the University of Toronto took up this work. Difficulties in the training which were very obvious when there was a small number of students were not so apparent where the student body was larger and classes could be divided, and so Queen's withdrew from the field after having shown the way.

Extra-mural work was begun with considerable misgiving about forty years ago. The necessity of some such arrangement was obvious. Students who were paying their way through College had occasionally to stay out for a winter in order to earn more money, and the University tried to give them some guidance in the keeping up of their studies. Out of this a definite system gradually emerged. There were hundreds of school teachers all over Canada who had begun to teach in primary schools without a university qualification, and they consequently found their promotion blocked and their usefulness limited. The University undertook the extra-mural system, which makes it possible for a student to cover from one-half to three-quarters of his Arts Course without attendance. The service thus rendered to the teachers of the province has been inestimable, and a large proportion of the University prizes falls to the extra-mural students, who are generally speaking senior to the intra-mural.

The Summer School was initiated some years ago also for the benefit of teachers. In 1910 it had 24 students; in 1916, 99; and in 1920, 218. Kingston itself is ideally situated for a Summer School, and there is every indication that this effort has become a permanent as well as an effective agency in the educational life of Canada. It gives teachers an opportunity to satisfy the residence requirements for a degree, or to continue their studies in their special field. It affords extra-mural students the opportunity of doing laboratory work in Science. The students in the Summer School are mainly from Ontario, although every province is represented. As illustrating the enthusiasm of the students, it may be stated that they have formed their own Association for publicity purposes. The advertisements of the Summer School which appear from time to time in the press are paid for by the students themselves, who in this and other ways bring the work of the School before the notice of every teacher in the province. No other Summer School in Canada is serving a third as many students as Queen's.

Through these two agencies of extra-mural work, and Summer School courses, Queen's University is offering the most effective and most widely utilized provision whereby teachers throughout the Dominion, and particularly in Ontario, can advance their standing and keep their knowledge fresh and their interest keen.

Courses in Commerce and Administration. Queen's was the first Ontario University to establish Courses leading to the degree of B.Com. The Course consists of two years' fundamental work in general Arts, followed by two years' work in economics and in technical courses such as accountancy, corporation finance, and industrial management. One course provides the non-professional training for Commercial Specialist teachers.

Engineering and Commerce. A combined course in Engineering and Commerce and Administration is under contemplation at the present time, and will fill a great and growing need. This is intended to give for the first time in Canada such a training to the Engineer as will qualify him to undertake the financial and administrative as well as the technical side of engineering work.

Banking Course. The B.Com. degree was the natural outcome of the University Extension work among bankers. The large Canadian banks were sensible of the need of providing for their employees instruction upon the wider aspects of their work, and so in 1914 an agreement was made with the Canadian Bankers' Association whereby the University undertook to "prepare a syllabus, conduct examinations, provide tuition in the advanced courses, and award diplomas; in other words, occupy as far as possible a relation to the banks corresponding to that of the Institute of Bankers in England." By July, 1920, no fewer than 538 bank officers had completed these Courses, and the Journal of the Canadian Banking Association for that month states:

"The students themselves proffer testimony as to the value of such a Course not only in assisting them with their everyday routine, but in giving breadth and freshness of view, in revealing the wider relations of their chosen work, in helping to interpret current trends in our complex economic and financial life, and in opening up new fields for thought and study."

At present about 400 students are registered in the Banking Course. Queen's initiated this branch of work, which has not been paralleled in any other university in Canada or abroad.

Research.

While the burden of teaching borne by Queen's professors has always been great, and while it has been felt that the needs of the undergraduates must first be served, there is and always has been a large amount of research work carried on by Queen's professors. For a great many years Dr. A. P. Knight has been doing work on the Conservation of the Lobster Fisheries for the Biological Board, work which has contributed materially to the knowledge of the subject. Professor S. F. Kirkpatrick's work on the metallurgy of the ores of Cobalt, of the scheelite ores of Nova Scotia, and the gold ores of Porcupine, has resulted in practical processes now operated on a commercial basis. Professor C. W. Drury's investigations have led to a successful method of extraction of potash from feldspar. Professors Connell and Lothrop carried on investigations of late cases of Trench Nephritis among the soldiers in the military hospital stationed at Queen's and obtained important results, which led to the conclusion that this form of the disease was of only temporary character, and might yield to treatment. Since the influenza epidemic of two years ago Professor G. B. Reed has been investigating the variability of the bacillus responsible for the disease, and discovered that there are at least five distinct groups only distantly related. He has also made a fruitful investigation of the protection afforded by serum treatment. Professor Clark's work on Critical Phenomena in liquids led to an invitation to co-operate on a similar investigation in the University of Leyden, Holland, which work was carried out a few years ago with important results.

Research is being carried on in the departments of Physics, Chemistry, Bacteriology and Botany at the present time under a system of grants made by the Board of Trustees upon the recommendation of a standing committee of scientific research. This is believed to be the first attempt in Canada to organize a concerted movement among the scientific departments of a university to stimulate increased activity in this important university field. The grants are made to purchase apparatus, books and supplies and for the employment of assistants for the routine work. The plan serves the double purpose of encouraging the work and of training workers. The problem of training research workers is perhaps one of the greatest of all connected with the development of research in Canada.

At the present time there are in Queen's upward of a dozen men trained in scientific research, who could, if they had a little more time at their disposal, produce a very large amount of important work. The plant is here, and all that is needed is a moderate amount for equipment and supplies and more assistance, so that time could be available for the work. The amount of work that would be done is out of all proportion to the expenditure. Many of these men are spending all or a part of their summer holidays in research, feeling that this is an absolutely necessary part of their work.

Queen's was the first university to establish a research professorship in Science. In 1919, the Chown Research Chair was established by G. Y. Chown, B.A., then Registrar of the University. This is to be in the department of either Physics or Chemistry. The first incumbent is A. L. Hughes, D.Sc., of Liverpool and Cambridge Universities, who is engaged in a series of researches on phenomena associated with the passage of electrical charges through gases and on allied problems. Dr. Hughes is one of the world's best known physicists, and has already obtained results of great value. With the exception of two or three hours per week of lecturing, his time is devoted to research.

Queen's was the first to establish a course for the training of research physicists. In 1918 a course in Engineering Physics was established in the Faculty of Applied Science, in which by a suitable combination of the work in the Science and Arts Faculties men could be trained in Physics, Mathematics, Chemistry and Electrical Engineering, so that they can undertake work in Research Laboratories.

Queen's was also the first to establish courses for training research workers in Biochemistry, Bacteriology and Biology.

Research, in the sense of the endeavor to make additions to the existing stores of knowledge, takes a somewhat different direction in the non-Science department of Arts. In a subject such as Philosophy, or History, or Mathematics, or Classics, the primary requirements are men of the reflective and inquiring bent, and adequate library resources. The Faculty of Arts in Queen's has always been fortunate in possessing men who had the will and the power to blaze new trails. The work of Dupuis in Mathematics, of Glover in Latin, of Shortt in History and Economics, of Caddon in literary criticism, and of Watson in Philosophy, is an enduring contribution to Canadian scholarship of which we feel proud.

Recently steps have been taken to furnish additional facilities for workers in some of these fields by (1) contributing to the travelling expenses of competent men in the pursuit of Canadian inquiries, and (2) by providing for the publication, in a

series of University Studies, of such results of research and study as are considered to warrant it. As an instance of the work being done in Arts, and as a distinctive feature of Queen's work, we may note the studies now in process on various economic questions. The Trustees have recognized the pressing importance of social and economic issues, and the difficulty which the public meets in finding accurate and systematic information on scores of vital Canadian questions. Assistance is, therefore, being given in the preparation of studies which will endeavor, not to debate policy, but to present the facts necessary for judgment. Money and time have been lacking to do more than a fraction of what is needed, but two typical inquiries have been carried on: (1) an investigation by Professor W. C. Clark into the organization, method and policies of organized labor in the west, particularly in Winnipeg and Vancouver; and (2) an investigation by Professor W. A. Mackintosh into the economic and financial phases of the western rural co-operation movement. Reports on both investigations are to be published shortly.

Student Self-government.

Queen's was the first university in Canada to introduce student self-government, and it still carries the policy to an extent no other university has ventured to attempt. All the discipline of the students is attended to by the students themselves. If the Principal has received a complaint of the conduct of a student, he reports it to the Alma Mater Society, which deals with the matter in no uncertain way. Altogether the system has given a wonderful training to many generations of students, and it has increased self-respect and the sense of responsibility. It is confidently affirmed, too, that the order maintained under this system is better than that which could be enforced by any method of outward compulsion.

War Activities.

While Queen's during the war did only what every other university did—what it could—its activities had some special features which may be recounted briefly.

Field Engineers. For some years prior to the war Professor Macphail had carried on a successful company of Field Engineers in connection with the Faculty of Applied Science. Immediately on the outbreak of war he offered the services of the company, and it was at once employed in laying out the camp at Valcartier. After it had proceeded to the front a second company of Engineers was organized under Major Lindsay Malcolm.

No. 1 Field Ambulance. As soon as the war broke out, Dr. A. E. Ross, one of our professors, who had seen service in Africa, volunteered, and was at once placed in charge of No. 1 Field Ambulance. In this command he took with him a number of young graduates and under-graduates, who accompanied him to France. Throughout the war he remained at the front, and for the last year was Director-General of the Canadian Medical Services in France, with the rank of Brigadier-General.

No. 7 General Hospital. The Medical Faculty tendered to the Government in 1914 the personnel and part equipment of a Stationary Hospital of two hundred beds. Early in 1915 this was accepted, and the hospital was recruited and sent overseas in May, 1915. This unit was considered so effective after a short service in England that the War Office asked the Faculty to send reinforcements to make up a hospital of four hundred beds, and designated the enlarged unit for service in Egypt. Again, while the Hospital was established in Cairo, the Faculty was requested to make up the personnel to enlarge the unit to a General Hospital of one thousand beds. This also was done. After twelve months' service in the East, the Unit returned to France, where it was again enlarged to one of two thousand one hundred beds, and as such it continued till the end. For some time it was the largest General Hospital in France, and it cared for an enormous number of patients. During its service abroad, the Faculty, with the assistance of the local Red Cross, sent supplies and money for special equipment as well as for comforts for the patients.

When the Hospital was well established, the Faculty again tendered a Field Ambulance, and this was accepted and became a most useful and efficient unit.

It was with great hesitation and trepidation that the Faculty entered upon the first undertaking, that of the Stationary Hospital of two hundred beds, and serious doubts were expressed as to the possibility of such a small institution being able to carry it on successfully. The generous support given to the Faculty finally made it possible to staff and recruit, as well as to assist financially, the units mentioned.

Although the Teaching Staff was depleted and disorganized by these efforts, the school was kept open continuously, all the year round, through the period of the war, and the graduation of our students was hastened in every way consistent with proper

and complete training. The result was that during these years there were two hundred and thirty-one young men graduated, of whom almost every one who was medically fit entered the Army Medical Services of Canada or Great Britain.

253rd Battalion, C.E.F. This unit was organized among the student body by Lieut.-Colonel P. G. C. Campbell, and was broken up to supply reinforcements on its arrival in England.

46th Battery, C.F.A., and 50th Battery, C.F.A. The 46th Battery of Field Artillery was organized by Major L. W. Gill, and served in France with the greatest credit. The 50th Battery was broken up in England.

Queen's Military Hospital. The University turned over to the Government the New Arts Building and the Grant Hall for hospital purposes. The whole building made an excellent hospital of nearly 400 beds.

Soldiers' Civil Re-establishment. The whole of the Mechanical Laboratories and much additional space was handed over to the S. C. R. for the training of disabled men. Up to the conclusion of the war Professor Manly Baker was in charge of this work, and all possible help was given to it by members of the University Staff.

Summer Session for Returned Men.

In the spring of 1919 many returned students were at a loose end. The University undertook to carry on a summer session, beginning in April and ending in October, for the benefit of returned men only. Every branch of engineering was offered, and about 100 men attended. The Dominion Government might have assisted this work as a part of the Soldiers' Civil Re-establishment policy, but no help was received. This effort cost the University about \$17,000.

(f) *Aid should be given to Queen's because of the rapid growth of the institution and its large contribution to the educational needs of the province.*

The Faculty of Arts.

The Faculty of Arts in Queen's University has always been regarded as one of the strongest of its kind on this continent. The University itself was formed on the model of Edinburgh University, and effectively maintained the tradition of a thorough training in Classics and Philosophy. Mackerras, Fletcher, Dupuis, Glover, Cappon, Shortt and Watson have given the School a first class standing. In spite of the trend of the times towards economic and scientific study the humanities still hold their place. A gratifying feature of the University life is the large number of men who combine with a Science and a Medical training a Course that qualifies for a degree in Arts.

The Faculty of Applied Science.

The Science Faculty was founded as the School of Mining in 1893. The first class graduated in 1897 with two members. It was not found possible to confine the instruction given to mining engineers to mining alone. The right kind of mining engineer had to know more than appertained to mining. Thus to serve the country more efficiently the scope of the School was gradually extended to include courses in Electrical, Civil, Mechanical, and Chemical Engineering, as well as courses in Chemistry, Geology, and Mineralogy, and finally Engineering Physics. The additional staff and equipment necessary for these courses has not been excessive. A study of the table in Appendix X will show the growth in the various courses and the fluctuations. When there is a mining boom the influx into the Mining Course is remarkable. When the railroads are engaged in building, or there is other work requiring civil engineers, this Department is the popular one. The war brought Chemical Engineering into prominence, and a great development of this Course was demanded. Just now the Departments of Mechanical and Electrical Engineering are becoming more popular owing to the demands in these lines. By maintaining all of these departments Queen's is able to use her staff and equipment to better advantage than she could with fewer departments. When one department loses by the falling off in the demand for men, another gains, and the overhead expense remains about the same. With the growing feeling at Queen's that the emphasis must be laid more and more on the fundamental training of the engineer, the difficulties introduced by the fluctuations are minimized. Further, the equipment is kept smaller, and therefore up to date.

The staff of the School is young and progressive, including graduates of the best Engineering Schools on the continent. In-breeding is very slight, the greater number of the staff being graduates of other universities.

The departments of Physics, Geology, Mineralogy, and Chemistry, while nominally in the Science Faculty, have always done the work for the Arts and Medical Faculties, while the work of the Science Faculty in Mathematics, English, French, German,

Spanish, and Economics is conducted by the departments of the Arts Faculty, so that the arrangement results in great economy and gives the students of all faculties a better point of view.

This Faculty has now 646 graduates and 397 students in attendance.

The Faculty of Medicine.

In 1854 the first classes in Medicine were held in Queen's University. The Medical Faculty was originally a Faculty of the University, but a separation took place in 1866, and for some years the Medical School was conducted under the Charter of the Royal College of Physicians and Surgeons at Kingston. In 1892 the Faculty again became an integral part of the University system. In 1913 the finances of the School were merged with those of the University. At the present time the Medical Faculty has the same relation to the Board of Trustees and Senate as the other Faculties.

Appendix XI will show the districts from which the students come and the districts in which the graduates are now labouring. It will be noticed that a large proportion of the medical graduates in the University are in country districts where need for medical attendance is great and the supply is often limited. About 1,700 graduates of the School are at present alive and practising throughout the world. In 1914 a five-year academic course was adopted, and this year the six-year curriculum has been entered upon. More students offer for entrance to the Faculty than can be received. The University limits the number of men in the first year to 50, and finds that for this number the clinical facilities are ample. Great efforts are being made to maintain the teaching in the Faculty on a high level. There are six full-time professors, six full-time assistant professors, two full-time lecturers and three full-time fellows on the staff, apart altogether from the clinical teachers. In addition two part-time professors have been appointed this summer, in Medicine and Surgery, at what is for Queen's the large salary of \$5,000 a year. There is every indication that these appointments will bring to Kingston a much larger amount of clinical material from the country districts than has hitherto been available.

Up to this year the greatest need of the Medical Faculty was the enlargement and reorganization of the Kingston General Hospital, the appointments to which were already controlled by the University. Owing to the grant made by the Ontario Government and the great liberality displayed by Kingston there is nearly \$1,000,000 available. The rebuilt hospital will have 214 public beds. There is as well a great deal of material in the other institutions in the city. The Hotel Dieu, close to the medical buildings, has about 150 beds, and students have access to the wards of this hospital. In the Hotel Dieu there are two operating rooms and a classroom for clinical teaching. A recently established obstetrical department is growing rapidly. Rockwood Hospital for the Insane contains 650 beds, and the Superintendent and his assistants are members of the teaching staff of the Medical Faculty. Students have free access to this hospital, where medical and surgical and gynaecological clinics are given as well as Psychiatry. There is an operating room and an amphitheatre specially built for teaching. Numerous post-mortems are held, always conducted by the Professor of Pathology. The opportunities for teaching and study at Rockwood are invaluable. The Mowat Hospital for tuberculosis is within a short distance of Rockwood Hospital; the average number of patients is about 150. All types of cases, incipient, progressive and terminal, are received. The executive medical officer of the hospital is a member of the teaching staff of Queen's, and gives regular clinical instruction. These four hospitals furnish about 1,100 beds for teaching purposes.

The military hospitals have supplied a large amount of clinical work for the past five years, and these facilities will continue for some time to come.

The number of students enrolled in the different years is as follows:

First year	46
Second year	70
Third year	39
Fourth year	45
Fifth year	40

It will be noticed that the numbers in the second year exceed the limit of fifty. This is due to the fact that the University determined to give preference to returned men, with the result that it found itself, under the conditions, obliged to go beyond its self-imposed limitation.

The facilities for post-graduate and research work are as follows:

1. Hoffman Scholarships.

- (a) Surgical Pathology, \$1,000 per annum.
- (b) Surgery, \$750 per annum.

2. Teaching fellowships for young graduates in

- (a) Anatomy.
- (b) Pathology and Bacteriology.
- (c) Physiology.
- (d) Chemistry.

These appointments all provide opportunity for post-graduate and research work.

3. D.P.H. Course as outlined in Calendar.

See Appendix XII for details of the growth of the University.

(g) Aid to Queen's is necessary if the University is to continue the work it has been doing so successfully.

The necessary increase of salaries, the higher costs of operating and maintaining the plant, the enormous advance in prices of all physical material, have more than counterbalanced the recent addition of \$1,000,000 to the endowment. A third of the new income thus obtained has been absorbed by the increased cost of coal alone. Although the utmost economy is being practised, the University will have a deficit of \$40,000 at the end of this financial year. For reasons stated on page 3 it is practically impossible at this time to secure any considerable addition to the endowment from private sources. If, therefore, the University is even to maintain its present status, it must receive further aid from the province, not only for ordinary costs of maintenance, but for capital expenditure that has become imperative.

(h) The present tendency in the United States, and particularly in the United Kingdom, is to give state aid to all efficient educational institutions doing work of University grade.

Example of the United States.

It is sometimes declared that the example of the United States supports the theory that each state or province should concentrate its aid wholly upon a single state-controlled institution. The facts do not bear out this contention. There are at least four distinct policies observable in the United States:

- (1) A few states, particularly in the east, make no grant to institutions of University rank, or only a nominal sum, e.g., Delaware, Rhode Island, Florida.
- (2) Some states, chiefly western, give grants to one state-controlled institution only, e.g., Arizona, California, Louisiana, Nevada, Wisconsin, Wyoming.
- (3) Some states, a larger number, give grants to two or more state-controlled institutions, e.g., Michigan, Ohio, Kansas, Iowa, Colorado, Washington.
- (4) Some states give grants to two or more institutions, of which some may be state-controlled, and some have independent governing boards, e.g., New York (to Cornell, Syracuse and St. Lawrence), Massachusetts (to Massachusetts Institute of Technology and Worcester), Pennsylvania (to the University of Pennsylvania and the University of Pittsburgh, as well as to the state-controlled Pennsylvania College), New Hampshire (to Dartmouth College, as well as to the state college), and Virginia (to the College of William and Mary, as well as to the state-controlled University of Virginia).

While states of good educational tradition are to be found supporting each of the latter three policies, it may be noted that within the past twenty years the trend has been distinctly along the line of the fourth policy, granting aid to every institution which has proved its place in the life of the community and is doing necessary and effective work, whether founded originally by state action or by private endeavor.

Example of the United Kingdom.

When we turn to the United Kingdom, where interest in higher education is quickening and grants to higher education increasing rapidly, we find the absolute and unquestioned adoption of the principle of granting aid to every existing institution which maintains university standards and is doing effective work.

The universities at present in receipt of grants from the national treasury are: Birmingham, Bristol, Durham, Leeds, Liverpool, Manchester, Sheffield Universities, and Nottingham, Reading and Southampton University Colleges; and in London, University College, King's College, Bedford College, School of Economics, East London College; University of Wales and Aberystwyth, Bangor and Cardiff University Colleges; St. Andrew's, Glasgow, Edinburgh and Aberdeen Universities; The National University and University College, Cork, University College, Galway, and University College, Dublin, Queen's University, Belfast.

It will be noted that this list includes every university and college in the United Kingdom except Oxford, Cambridge, Trinity College, Dublin, and Exeter University College. Until recently Oxford, Cambridge and T. C. D. found their old endowments sufficient, but of late the influx of students and the decreased purchasing power of their rents and revenue has led the former two to seek state aid. Oxford is already receiving a grant for its Engineering School, and Cambridge for its Medical School. A Royal Commission was appointed a year ago to inquire into the financial resources of these two universities, and while it has not yet reported, the trend of the discussion makes it apparent that in addition to some shifting of old endowments, state grant will be recommended. If this is effected, every university, and university college of recognized standing in Great Britain will be in receipt of an Exchequer grant. Exeter is excluded because it has not yet developed the financial resources or the academic reputation considered necessary to warrant state aid.

The grants have increased rapidly in amount. The first state aid to higher education in England and Wales was the grant of £2,000 to Aberystwyth College in 1882; in 1887, Manchester received the same amount, the first grant to an English University. By 1912 the Exchequer grants reached £175,000, constituting, in the case of the English colleges, 35 per cent. of their income, and, in the case of the Welsh colleges, 54.3 per cent. In addition nearly £100,000 was voted for special technological and professional work. The Exchequer grant alone to the Universities of England and Wales for 1920-21 is £1,000,000; for 1921-22 it is to be £1,500,000, plus a grant for pension funds. This is considerably more than three times as much as was allotted just before the war.* The four Scottish Universities received aid for many years earlier; their grants and the grants to the newer Irish institutions are also rising rapidly.

The grants are usually for maintenance, though in the case of the newer Irish Universities sums have been provided for capital expenditure, and similar grants have recently been recommended for Wales.

Methods of Allocating Grants to British Universities.

As to the method and basis of allocation, a recent Bulletin of the United States Bureau of Education states:

"The new universities, though the charters run in the name of the Sovereign, are universities of the people, founded by local contributions and generosity. They are not, therefore, State universities in the American sense of being State-owned and State-controlled, though so largely State-supported. The grants are determined on the report of experts in consideration of two facts: (1) The efficiency of the university and the value of the work which it does, and (2) the extent of the local support which it receives. The Treasury, the board of education, or other board administering the funds, constitutes advisory committees, ordinarily quinquennially, consisting of the most eminent educators or experts, who serve without salaries. This method of distributing State aid in lump sums, together with the broadly representative membership of the autonomous governing board of each institution, prevents the evils of State interference and combines the benefits of State relationship with efficiency and freedom in the institution."**

The Scottish University Commission of 1900 deals with the question of the basis of allocation as follows: "In framing a scheme of division we felt it to be our duty to consider in each case, not only the needs but the opportunities and the number of students of each university, and also the extent to which they had respectively been able heretofore to contribute to the general education of the country. The scheme of distribution was accepted by all four Universities as just and satisfactory."

IV. What Queen's has done for itself.

Steps which led to the foundation of the University were taken by the Presbyterian Synod in 1835 at the height of the controversy over the clauses in the charter of King's College confining control and teaching to the members of the Church of England. The

*"His Majesty's Government fully appreciates the vital importance of the work of the Universities in the national life, and Parliament has recognized that importance by sanctioning recurrent grants-in-aid amounting to £1,000,000, a figure rather more than double the grants paid before the war, as well as a non-recurrent grant of £500,000, to assist the Universities to restore their pre-war activities. . . . Having regard to the urgency of the matter . . . I will submit to Parliament an increase in the present vote from £1,000,000 to £1,500,000 in the estimates for 1921-22." (Letter from the Chancellor of the Exchequer to the Chairman of the University Grants, July 16, 1920.)

**The present committee consists of: Sir William McCormick, of the Carnegie Trust; Dr. Bateson, formerly Professor at Cambridge; Sir D. Clark, formerly Director of Engineering Research for the Admiralty; Sir J. Dobbin, Principal of the London Laboratory; Miss M. F. Fry; Sir F. G. Kenyon, director of the British Museum; Sir William Osler, Regius professor of Medicine at Oxford (now deceased); and Sir J. J. Thomson, president of the Royal Society.

charter was granted to Queen's in 1841; classes were opened in March, 1842, but twenty-five years after the foundation of the University its affairs were in a most critical condition. It was largely due to the efforts of the late Principal Grant that the University survived its time of difficulty.

(a) The original *endowment* amounted to \$50,000. Campaigns in 1869, in 1887, in 1902, and in 1912 raised in all nearly \$1,000,000. When the Theological College separated from the University it took \$200,000 of this endowment with it as its fair proportion of the whole. Another endowment effort, which has just been completed, has realized up to the present \$900,000. The total endowment now stands at \$1,790,000. This has been very largely gathered from a constituency that has been poor in material wealth but rich in its affection for the University.

(b) *War Deficits.* On the outbreak of the war Queen's, like every other university, found itself in a grave position. The student body had almost disappeared, while the fixed charges remained. For the first three years of the war Dr. James Douglas, the late Chancellor of the University, met the deficits, amounting during that time to nearly \$100,000.

(c) *Buildings presented by individual and corporate effort:*

1. *The Old Arts Building* was presented by citizens of Kingston, in 1880, at a cost of about \$52,400.

2. *The Carruthers' Hall* was presented in 1890 by the late Mr. John Carruthers, and cost \$29,500.

3. *The Kingston Hall*, the New Arts Building, was presented by the City of Kingston in 1904, and cost \$70,000.

4. *The Grant Hall* was presented to the University by the old graduates in 1905, and cost over \$45,000. The Commission may remember its stately interior, and will agree that it was very well worth the money.

5. *The Nicol Hall* was built in 1912 from funds mainly supplied by Professor William Nicol, Professor of Mineralogy. The hall cost \$70,000. Of this total \$45,000 was supplied by Professor Nicol under an arrangement by which his wife has a life interest in the amount.

6. *The Gymnasium* was erected by the student body in 1906 at a cost of \$30,000, and remains their own property.

7. *The Stadium*, which is approaching completion, has been wholly given by Mr. James Richardson, in memory of his brother, Captain George Richardson, a Queen's graduate and a famous athlete. The cost has already amounted to more than \$50,000.

(d) *Library and Residence Funds.*

In 1914 Dr. James Douglas gave \$150,000 for the erection of the new Library. On the outbreak of war building was deferred. The Library Fund now amounts to \$201,000. The Alumnae of the University have for years been engaged in raising funds for the erection of a Women's Residence, greatly needed. They have now in hand about \$65,000.

(e) *Kingston General Hospital.*

The Government of Ontario has recently made a handsome grant to aid in the reconstruction of this hospital. Apart from this grant, however, the Kingston Hospital has been entirely maintained by local benefactors, and the building, as it stands, is a product of repeated acts of liberality on the part of the citizens.

Reconstruction of the Hospital. The sums available for rebuilding are:

\$100,000 from late Dr. James Douglas.

\$100,000 from estate of the late Senator Richardson.

\$100,000 from subscriptions of the citizens of Kingston.

\$150,000 from the Corporation of the City of Kingston.

\$50,000 from the County of Frontenac.

\$30,000 from the Counties of Lennox and Addington.

\$400,000 from the Government of Ontario.

\$930,000

V. *What the Government of Ontario has done for Queen's.*

Early in 1892 Principal Grant approached the Ontario Government, with a view to securing assistance for the University. The Government did not see its way to change the policy of not making grants to denominational colleges—a policy which had been

inaugurated by Mr. John Sandfield Macdonald in 1867. Sir Oliver Mowat, however, who was Premier of the Province in 1892, intimated to Principal Grant that the Statutes of Ontario, 1891, chapter 60, contained an Act for the establishment of Mining Schools for municipalities singly or in groups, and that at the previous session grants had been voted to equip and sustain a School in Port Arthur, and to pay the salary of an instructor. Sir Oliver said that this grant had not been made use of, and that if Kingston cared to establish a School, a grant would be available. The hint was taken, and in December, 1892, it was decided to establish a School of Mining and Agriculture in Kingston, with a Directorate which would link for practical purposes the School with the University. In 1893 the School received a grant of \$5,000 for maintenance. In the following year it received the same sum for maintenance, \$5,100 for a Mining Laboratory, and \$3,500 for the Dairy School. From that date until 1916, when the School of Mining was amalgamated with the University, the Ontario Government made grants for the erection and equipment of five buildings, to be devoted to work in Mining, Civil, Mechanical, Electrical and Chemical Engineering, and was at the total expense of the operation of the School of Mining, with the exception of the fees received from the students and the interest on the original endowment, privately raised, of \$43,000.

The buildings given by the Government of Ontario to the University are as follows:
1894—The Mining Laboratory, costing \$14,800.

1902-04—The Central Heating Plant,
Fleming Hall, housing Mechanical and Electrical Engineering,
Ontario Hall, housing Physics, Geology and Mineralogy,
at a cost of \$164,000.

1905—The New Medical Building, costing \$50,000.

1911-15—Gordon Hall, housing Chemistry and Chemical Engineering, costing \$120,000.

Government Grants.

These grants began in 1893 with \$5,000 for the School of Mining, and until the separation of the University from the Presbyterian Church the grants were all confined to the School of Mining and Agriculture. Since 1912 all the Faculties of the University have shared in the Government grants. In recent years the recognition of growing needs has brought a steady and substantial increase. The grant for the year 1919-20 is \$165,000, and \$80,000 is being given through the University to the Kingston General Hospital as one-fifth of the total grant of \$400,000 for re-building the hospital.

VI. Future Requirements.

A. Plant.

Taken as a whole the equipment of the University is good. Every Faculty is in first-class working order. Since the outbreak of war, however, and the consequent rise in prices comparatively little has been added to the equipment of the University, and repairs have been delayed as far as possible.

Additional Buildings Needed.

(a) *The new Central Heating Plant on the water front.* The land for this plant is available, but not purchased. The reasons for urgency are these:

- (1) The present plant is working to its extreme capacity. Nothing can be undertaken in the way of building which will not involve an extensive alteration of the present heating plant.
- (2) The position of the present plant is unsuitable. Though its central situation means a minimum range of piping, it also involves the constant blowing of smoke upon one or another of the surrounding buildings, with the result that the gutters are rapidly corroded. Moreover, there is no room for the storage of coal, which, on being drawn from the water front or from the railway station must be piled about the grounds until needed, and then re-hauled to the fire-hole. This means the disfigurement of the campus and the expenditure of a large sum for cartage.

The removal of the heating plant from Fleming Hall would provide room for the expansion of Mechanical Engineering without additional building.

- (3) The plan for co-operation with the Hospital. The Kingston General Hospital is about to be rebuilt. It has, at present, no Central Heating Plant, and runs no fewer than seventeen furnaces. The Hospital consequently has to reconsider its heating arrangements and the University, whether it erects a new plant or extends the old one, has to face large expenditure. In view of the close connection between the University and the Hospital it would appear to be altogether uneconomical to erect two new Heating Plants. As the University is much the larger user of heat and power the suggestion is that the University should build and operate a Heating Plant on the water front and sell heat to the Hospital, through the grounds of which the piping to the University must in any case pass. A competent engineer, who has recently investigated the whole matter, on the joint request of the Trustees of the University and the Governors of the Hospital, states that the new plant on the water front would cost, including land, dock, coal handling equipment, and all service for both institutions, about \$250,000. It is confidently believed that this is a sum less than that which would require to be spent on heating by the two institutions separately, while there would be the continued economy through the operation of one plant instead of two, and through saving in the haulage of coal.

(b) *New Library Building.* The present Library contains an admirable collection of books amounting to about 80,000 volumes and about 15,000 pamphlets, including the most valuable collection of Canadiana in existence. In several respects it is the best University Library in the Dominion. The congestion, however, is so great that it is almost impossible to allow students to have access to the shelves. Stacks have been placed between stacks until the titles of the books can hardly be read. Such extensions as could be made in the present buildings have been utilized for stack and reading-room purposes, but the whole work of the University is suffering seriously from the fact that it is impossible under present conditions to allow the students to use the Library as a library should be used. There is also grave danger of fire under the present conditions. What can be done has been done to make the Library fire-proof, but it is impossible so to remodel the Old Arts Building as to make it a satisfactory home for so irreplaceable a property as the University Library. It is proposed to erect the new Library on a site north of Ontario Hall. The funds available from the Douglas gift are, as has been stated, about \$200,000. The estimate of the architect is that the whole building as planned could be erected for \$375,000. A grant of \$175,000 would, therefore, complete the Library.

(c) *Residence for Women.* Until a few years ago women students, who came to Queen's, had to find lodgings in exactly the same way as men students. The University saw to it that the lodging-houses were supervised, but, while the record of the students was wholly good, parents naturally looked for the taking of some more personal interest in their daughters. The result was the renting of first one house and then a second, these two houses having accommodation for about sixty girls in all.

For several years the *Alumnæ* have been labouring to raise money to erect a Residence which could be built in units, and which will eventually accommodate all the women students with the exception of those whose parents reside in the city. It was thought that this building could be erected for \$160,000, and the trustees agreed to give the *Alumnæ* substantial assistance when the contributions from private sources had reached the sum of \$80,000. Renewed efforts by the *Alumnæ* have made it evident that the University will soon be called on to fulfill its obligation. The estimate for the Residence is now, however, \$185,000, and the trustees can redeem their promise only by divesting the University of a portion of its slender endowment. One hundred thousand dollars from the Government would permit the building of the Residence to be proceeded with at once, and would allow the trustees to maintain intact the endowment of the University.

(d) *Extension of Existing Buildings.*

(1) *Chemical Engineering.* In the Chemistry building only one room is given to the subject of Chemical Engineering, which is yearly becoming more and more important. A wing could be thrown out to the south of the Chemistry Building, similar to that which has already been erected to the south of the Metallurgy Building, for the purpose of the housing of Chemical Engineering. The probable cost would be about \$37,500.

(2) *Electrical Engineering* has outgrown its quarters in Fleming Hall. The equipment is good, but it is not possible under present conditions to give room for the students to work. A wing could be thrown out to the north of Fleming Hall which would accommodate the development of the Department of Electrical Engineering, while the erection of the new Heating Plant on the water front will give Mechanical Engineering room to expand in the space at present occupied by the boiler room. The cost would be about \$37,500.

(3) *Hydraulics Laboratory.* With the development of the Hydro-Electric power of this province, the need for study of hydraulics and power-plant development becomes increasingly important. For this, Queen's is admirably situated, but needs a small laboratory for this work, containing small units. The cost would not exceed \$30,000.

(4) *Biology.* The teaching of Biology has largely been confined to two dingy rooms in the Old Arts Building, and so brilliant a member of the staff as Professor MacClement has scarcely had any opportunity to develop his department. At present the teaching of Biology is carried on in three different buildings. Without the erection of any separate building, room could for the present be found in the attic of the Kingston Hall. Were this fitted up and several dormer windows thrust out six extra class-rooms could be provided. Room would thus be secured for Biology until the Pathological Department moved from its present quarters in the Medical Laboratories Building to the reconstructed Hospital. One great advantage in the fitting up of this attic floor would be that no additional heating would be required. The estimated cost in 1914 was \$17,000. Perhaps a figure of \$35,000 to-day would not be considered excessive.

(5) *Extension to Gymnasium.* The gymnasium, built by the students for themselves fourteen years ago, is inadequate for the increased student body. It is in use all day long, with the result that the women students have not received adequate gymnasium facilities. The gymnasium should be extended either by the addition of another floor or by the thrusting out of a wing.

(e) *Skating Rink.* The present Skating Rink is completely outworn. Plans have been drawn for the erection of a new rink with a sheet of ice 210 ft. by 90 ft. upon the present site. The Athletic Association looks to the graduates for large help in this matter, particularly as circumstances may compel the Association to proceed with the erection of a new rink by next winter.

(f) *Students' Union.* Queen's greatly suffers from the lack of a Students' Union. There is no one place where the student body can gather, and the close intimacy of the members of one Faculty with another has been due only to the fact that all the University buildings are upon the one campus. At present the Arts students have a room in the Arts Building; the Engineering students a room in Carruthers' Hall; the Medical students a room in the Old Medical Building.

The Dominion Government, which occupied the New Arts Building during the war as a hospital, left the temporary kitchen which it had erected, and this kitchen has now been converted into a cafeteria. The premises are not very suitable for the purpose, and in any case the structure is such that its life cannot be long. Still, such as it is, the cafeteria meets a real want. The students can purchase twenty-one meal tickets for \$5.50. A Students' Union, however, where all the student activities would be centred, is greatly required. Here again private liberality may be expected to realize the necessity.

(g) *Residence for Men.* No provision whatever has yet been made at Queen's for men's residences.

New Equipment Needed.

Five thousand dollars spent on *Mechanical Engineering* would enable the staff to do as good work as is done in any school if larger quarters are provided as suggested above.

Electrical Engineering needs a similar amount for equipment.

In *Civil Engineering* new equipment is required, but the amount need not exceed \$5,000. The other departments must have additional equipment, but this should be acquired gradually, and the amount needed is not excessive.

Mining Engineering. An expenditure of \$5,000 would provide small laboratory equipment adequate to deal with small quantities of ore. With such apparatus the tests required by the ordinary shipments from mining engineers can be carried out.

In all of the Engineering Departments at Queen's the tendency is toward smaller units in the laboratories. They serve the purposes of teaching, and can be overhauled, or rebuilt, or even scrapped when out of date, and new units can be purchased. This is impossible without enormous expense when the equipment is very large. It is the growing conviction at Queen's that emphasis will be placed more and more on the fundamental training of an engineer and less time will be given to the details of technique, which must eventually be acquired in the actual plant or laboratory in which the graduate finds himself. Hence the stress placed on the small equipment. The required additions to buildings and equipment are very small indeed compared to the value of the plant and equipment now in use.

Repairs Which Are Needed Immediately.

(a) *On the Old Arts Building.* The floors are done and should be relaid with hardwood; the building must be rewired and generally overhauled.

(b) *In the Carruthers' Hall* the roof requires to be renewed, and a number of structural changes made in the laboratories.

(c) *The Mill or Mining Laboratory.* Eventually the present building should be torn down to make room for a more dignified and serviceable structure to house the mill work and the University machine-shop. The present mill has had practically nothing done to it for a great many years, but with moderate repairs it can be made to serve a long time. Two thousand dollars a year over a period of five years would bring the mill up to an adequate level. Large lots of ore in amounts up to five tons are frequently sent in, and the amount could be increased if facilities permitted. The ability to do work of this kind has made Queen's of great service to the province.

(d) Generally speaking, the limestone buildings require constant attention and pointing on the south and west sides.

B. Maintenance.

It is not the intention of the University to branch out into new fields or faculties, but to seek to maintain and consolidate its present position. The following list of requirements covers simply the most careful estimate that has been possible of the expenditures essential to carry on our present work properly and effectively.

1. *Existing Provincial Grant* \$165,000
2. *Deficit.* With the utmost economy it has been found impossible to meet out of revenue the costs of present activities. The deficit for the fiscal year ending March 31, 1921, will be \$40,000. But the present scale of salaries has been in effect only since last October, and for the next financial year will involve an expenditure of \$14,000 more than in the current year. Even to carry on the present scope and scale of work will therefore require the addition to the present budget of \$54,000
3. *Additional Staff.* It is not intended to increase the numbers of the staff in any appreciable degree at present; if the existing staff can be held, they will be sufficient, with a few temporary appointments or shiftings to meet special growth, to do the work. We should, of course, be glad to have such an increase of staff as would permit more personal and individual teaching, but as it is not possible to meet every need, we think it more important to provide an adequate salary for a staff of substantially the present numbers. There are, however, two chairs now vacant, English and Public Health, and these would require at least \$8,000
4. *Salary Increase.* The greatest weakness of Queen's is the low scale of salaries paid the professorial and administrative staff. Increases have been made from time to time, but it has not been possible to keep pace with the rise in the cost of living. This is the serious side from the standpoint of the individual professor. From the standpoint of the University, the more serious aspect is that our salary scale has not kept pace with the rise in other Universities. This means inevitably that we shall find it difficult to attract men of the calibre we desire, and difficult to hold the better men on our own staff, or to ensure the reasonable degree of content and the freedom for continued study essential for effective work.

A comparison of some professorial salaries, in large institutions and in small in the United States and in four Canadian Universities, follows:

University.	Lecturer or Instructor.	Assistant Professor.	Associate Professor.	Full Professor.	Full Professor Head of Dept.
<i>Queen's</i> (including temporary bonus given October, 1920, average, Arts .. Science and Medicine.	1725	2420	2800	3115	3905
<i>McGill</i> , 1920, average, Arts, and Applied Science .. Medicine ..	2500	3150 2500	3750 4000	5100 5200 (range)	5000-6000
<i>British Columbia</i> , 1920, range ..	1600-2100	2200-2900	3000-3450	3800-5000	
<i>Toronto</i> ,* 1919 range .. 1920 range .. including bonus.	1500-2500 1875-3125	2500-3000 3125-3750	3100-3900 3875-4875	4000-4500 4800-5400	4000-5000 4800-6000
<i>Columbia</i> , 1920 ..	2000-2400	3000-6000	4500-5000	6000-8000 10,000 in some cases.	
<i>Harvard</i> , 1920 ..	1000-3000	3500-4500	5000-6000	6000-8000	
<i>Cornell</i> (endowment campaign in progress), average ..	1479	2639		4100	
<i>Wisconsin</i> , 1920 ..	1500-2200	2000-3000	2750-3750	3500-6000	
<i>Chicago</i> , 1920 ..		3000-4000	4000-4500	4500-8000	
<i>Ohio State</i> , 1919, average (Rapid "turnover" of staff.)	1883	2856	2912	4230	
<i>Haverford</i> , 1920 ..	1000-2500	3000	4000	5000-6000	
<i>Bryn Mawr</i> , 1920 .. (Women's College.)	1800-2200	2400-2700	3700	4500-5000	

These figures, and the chart (Appendix XV), make clear that an assistant professor in McGill or Toronto receives not merely more than our assistant professors, but more than our associate professors, and more than our full professors. It may be noted also that the proportion of associate to assistant professors is higher in both McGill and Toronto than in Queen's. McGill and Toronto associate professors are paid more than our heads of departments, and some heads fifty per cent. more than our heads of departments. The average salary of all those members of the staff of Queen's who have been in academic work since graduating from their University 25 years ago is \$3,420, or less than young assistant professors receive elsewhere.

This great discrepancy cannot be defended on the ground of difference in the cost of living. Montreal and Toronto are probably still slightly more expensive places to live in than Kingston, particularly as to rent and as to domestic service (the latter requirement, for most of our staff, is an item of what is humorously termed mere "academic" interest). It may be that standards of living are higher, but this is a matter of individual choice. Cer-

*In the case of the University of Toronto, exact figures are not known; the estimate given is based on press statements to the effect that the bonus given in 1920 amounts to twenty per cent. for full professors and twenty-five per cent. for others. Of course, as such bonuses are calculated on actual salaries and not on the range or scale, the figures given may not be exact, but this information will doubtless be in the hands of the Commission.

tainly the difference is small. Recent years have levelled living costs, east and west, in large cities and small, and, as the table given below indicates, living costs have risen since 1910 much more rapidly in Kingston than in the average Canadian city, and are now on a level with the Canadian average.*

Neither can the discrepancy be explained on the ground that our staff do not deserve equal consideration. We have no question that hitherto, whether in adequacy of training, or in power of teaching, or in productive scholarship, the staff of Queen's have been able to bear comparison with those of any other institution.

The fact is that the difference exists simply because we have not been able to help it. Costs rose faster than resources. We do not consider it is possible to bridge these gaps at once, or even to bridge them fully for some years to come. Our proposal, in view of all existing conditions, is that provision should be made for an immediate increase in the salary budget of approximately 20%, which will still make salaries at Queen's in no case higher, and in most cases lower, than corresponding Toronto salaries of 1919, without counting the bonus given to the professors of Toronto University this year. It would be desirable to be free, in a few cases, to offer somewhat more than our average, if necessary to secure men of special distinction. With readjustments in some of the administrative salaries this would involve an additional sum next year of \$52,000

5. *Equipment.* Assuming that provision is made to cover the accumulated war-time deficiencies, as proposed under Capital Expenditure, it is believed that additional annual outlay on the equipments in Arts, Applied Science and Medicine necessary to keep our work abreast of current developments (apparatus, maps, charts, departmental equipment), can be kept down to \$10,000
6. *Repairs and Contingencies.* Under Capital Expenditure some of the larger and more pressing requirements are given. In addition there are many minor needs calling for attention. Great economies have been exercised during the last few years in building matters. The administration of the University has been economical to the extent of parsimony. As an instance of this it may be said that with all its valuable buildings the University employs no night watchman nor has it any permanent works-staff. It has no carpenter, electrician, or plumber. These wants are met as occasion arises, but the University has now reached a point when it may be questioned whether this parsimonious administration is really economical. The need could be met by an annual amount of about \$15,000
7. *Library.* Before it will be possible to move into the new Library building, it is essential to recatalogue a large part of the books on a more modern and scientific basis. A beginning has been made, but it is necessary to do the work on a more extended scale. In addition, the rise in book prices makes it necessary to increase the funds available for current purchases. For these two purposes the minimum requirement would be \$4,000
8. *Improvement of Summer School.* We have in our Summer School a great opportunity. The firm basis it has secured, the eager support of its student body, the coolness of the Kingston summer, the example of summer schools in the United States, and the marked primacy our School enjoys in Canada, make clear that it is an asset to be developed. We hope to make it possible for Canadians in general to secure here much of the advantage they now seek in the summer schools of New York and Chicago, and for Ontario teachers in particular to find here in increasing measure a stimulus and an opportunity. To provide more adequately for instruction, and, for example, to secure the services, in common with one or two other institutions, of a man like Sir Arthur Quiller-Couch during a summer session, the sum is proposed of \$5,000

*DEPARTMENT OF LABOUR, FAMILY BUDGET

Kingston in 1905 taken = 100

	1905	1905	1910	Jan., 1915	Jan., 1920
In the average of the sixty Canadian cities listed	110	117	142	159	269
In Kingston (about 95)	100	100	117	157	268

9. *Improvement of Extra-Mural Work.* The extra-mural courses for teachers, leading to degrees in Arts might be made distinctly more helpful if funds were available for additional instruction and correction, and for the provision of more extensive instruction material, at a cost of \$3,000
10. *General Extension Work.* Something has been done in the way of extension lectures and the provision of information and courses of instruction for adults, who are not working toward a degree, but not as much as the needs demand. We could to advantage expend an additional \$4,000
11. *Commerce.* As yet, the instruction in Commerce has been largely a by-product of the work of the Department of Economics. To secure somewhat more specialized instruction, particularly in connection with the course in Engineering Administration now under discussion by the Faculty of Applied Science and the School of Commerce, the estimate of net additional requirements is \$4,000
12. *Research and graduate scholarships.* Research is not an extraneous or ornamental activity, but a vital and integral part of the work of any university which is more than a high school. The distinctive feature of University work is that its members are not content merely to hand on received knowledge, though that is important, but are bent on adding their share to the common stock. Given a staff of capable men, interested in their work, a large proportion of them will find it as natural to investigate, experiment, develop new lines of speculation, as to breathe. A notable number of the men we have and the men we want will be research men, whatever the material difficulties in their way.

Centralization of Scientific Research in one or two universities in a country like Canada would be fatal to the spirit of research. It would be contrary to the opinion of the world's experts. The heads of such great laboratories as those of the General Electric Co. at Schenectady, the Western Electric Co. in New York, and the Bureau of Standards in Washington, are opposed to such centralization. To deny to any university the right to conduct research is to stifle and condemn it to perpetual mediocrity. Only by cultivation of the research spirit wherever it can be found can this country take its place among the progressive countries of the world.

But research does not necessarily involve large expenditure. Some problems may call primarily for elaborate apparatus, but there are others which need mainly brains and time. Queen's University does not propose any increase in capital construction, or any additional appointments to the staff primarily for purposes of research. A very moderate addition to our funds would make it possible effectively to supplement the present equipment, and to give the staff more opportunity for original work. The sum proposed is \$20,000

\$344,000

SUMMARY OF THE NEEDS OF QUEEN'S UNIVERSITY.

I. *Capital Expenditure.*

1. What the Provincial Government might do for the University in the immediate future:

Central Heating Plant	\$250,000
Library	175,000
Women's Residence	100,000
Gordon Hall Extension (Chemistry)	37,500
Fleming Hall Extension (Electrical Engineering)	37,500
Hydraulics Laboratory	30,000
Kingston Hall Extension (Arts and Biology)	35,000
New Equipment for Faculty of Applied Science	20,000

Repairs are urgently needed for:

Old Arts Building, new floor and general repairs	15,000
Carruthers' Hall, including new roof	15,000
Mill or Mining Laboratory	10,000

Total \$725,000

Payment of this might be spread over a term of years.

2. What the Provincial Government might do at a future date:

A new building will be required at no distant time either for Physics or for Biology. The present Physics building is not wholly suitable for this purpose, for the basement is occupied by the Department of Mineralogy, and there is available, therefore, no sufficiently secure base for delicate instruments. If Physics were provided with a new building, Biology might occupy the present Physics Building.

A new Mining Laboratory will be eventually necessary. The present frame building dates from 1894.

3. What Queen's University can do for itself through private aid:

Students' Union.

Skating Rink.

Extension to Gymnasium.

Men's Residences.

Amounts already secured or in sight for Library and Women's Residence,
\$281,000.

4. *School of Agriculture.* Should the Government at any time feel disposed to undertake instruction in Agriculture in Eastern Ontario the work could be conveniently carried out in Queen's University. The present laboratories would serve for the purpose, and a very slight addition to the present staff would allow quite an elaborate scheme to be carried out by the Government at a minimum expense.

II. Maintenance Grant, 1921-1922.

1. Existing Provincial Grant	\$165,000
2. Estimated deficit for year ending March 31, 1922	54,000
3. Additional staff	8,000
4. Increased salaries	52,000
5. Equipment	10,000
6. Repairs and contingencies	15,000
7. Library, cataloguing and additional purchases	4,000
8. Improvement of Summer School	5,000
9. Improvement of Extra-mural work	3,000
10. General Extension work, not for degree	4,000
11. Commerce, including Engineering and Commerce	4,000
12. Research and Scholarships	20,000
	<hr/>
	\$344,000

COMPARISON OF UNIVERSITY REQUESTS.

Building and Other Capital Expenditure Extended over a Term of Years.

The University of Toronto (including \$300,000 for College of Education)	\$4,450,000, or 69%
Western University	1,300,000, or 20%
Queen's University	725,000, or 11%

Maintenance.

	1921-22.	Future.
University of Toronto	\$2,000,000	rising to \$3,000,000 in 10 years.
Western University	200,000	rising to 320,000 in 5 years.
Queen's University	344,000	and 15% of the total Provincial maintenance grant thereafter.

Of the total sum asked for maintenance for 1921-22,

The University of Toronto requests	78%
Western University requests	8%
Queen's University requests	14%

For the ensuing five years Queen's University requests an annual maintenance grant of 15% of the total Provincial appropriation, provided by statute or by special vote, for the maintenance of higher education.

APPENDIX I.

MEMORANDUM OF LEGISLATION RELATING TO QUEEN'S UNIVERSITY AT KINGSTON

SHOWING

"The essential terms of the original Charter of the University and any modifications subsequently made."

The Royal Charter.

1. By Royal Letters Patent, sealed at Westminster on October 16th, 1841, "Queen's College at Kingston" was established as a body politic and corporate pursuant to the declaration in the preamble of the Charter that "the establishment of a college within the Province of Upper Canada, in North America, in connection with the Church of Scotland, for the education of youth in the principles of the Christian religion, and for their instruction in the various branches of science and literature, would greatly conduce to the welfare of our said Province." The corporators were the Ministers and members of the Presbyterian Church of Canada in connection with the Church of Scotland, and the Board of Trustees was to consist of twelve ministers and fifteen laymen of the said Church. A religious test was required of the trustees, principal, and professors, but there was express provision that no such test whatever should be required of students either upon admission or graduation, except in the one case of admission to a "degree of divinity." The College was to be "deemed and taken to be a University," with power to confer degrees, and it was to have the right to hold property and to receive any money or gifts whatsoever. A College Senate was to be appointed for the exercise of academical superintendence and discipline, but the "Government of the Corporation" lay with the trustees.

Estate and Liabilities of University at Kingston Transferred.

2. Chapter 89 of 9 Vic. (Province of Canada) (1846) merely transferred to and vested in Queen's College at Kingston all the estate real and personal and all the liabilities of the University at Kingston, which had been incorporated by an Act of this province in the 3rd year of Her Majesty's reign subsequently disallowed.

Continuance of Relation to the Presbyterian Church in Canada. Establishment of the University Council. No Church or Religious Qualifications for Elective Members.

3. Chapter 76 of 38 Vic. (Ontario) (1874) provided for the continuance of the College in the same relation to the new "Presbyterian Church in Canada" (formed by the union of certain Presbyterian Churches) as it then held to the Presbyterian Church of Canada named in the Royal Charter. This statute also declared that the right to hold property should not be limited by any statute of mortmain; and, as the first step in the widening of the institution, it provided for a "University Council," consisting of the trustees, the members of the College Senate and a corresponding number of graduates or alumni to be appointed in the first instance by the Board of Trustees and Senate, but thereafter to be elected by the whole body of graduates and alumni under by-laws to be framed by the Council itself. No qualification as to Church membership or religion was required for the elective members. This Council was empowered to elect the Chancellor, but was given no right to assume any part of the control of the University except as an advisory or consultative body.

Confirmation of above Ontario Enactment by the Dominion Parliament.

4. Chapter 123 of 45 Vic. (Dominion) (1882) was enacted by the Dominion Parliament for the express purpose of settling doubts as to the validity of the last mentioned Ontario statute, and of giving full sanction to everything done. In terms it re-enacted the provisions of the Ontario statute and confirmed and declared valid anything done under and by virtue of that enactment.

Addition of Representatives of the University Council to the Trustee Board without requirements as to Church Connection. Relaxation of Religious Test for Professors.

5. Chapter 103 of 52 Vic. (Dominion) (1889) made a more important change by altering the constitution of the actual governing body of the University to provide for the election of a trustee annually by the University Council free from any requirement as to Church membership or religious declaration whatsoever. A trustee so elected was to hold office for five years, and five such trustees were thus in time added to the Board. This statute also left to the Board itself the prescription of the religious test for professors other than those of the Theological Faculty of the College. Broader powers to acquire and hold property were also conferred subject to Provincial laws.

Further addition to the Trustee Board of Representatives of the Graduates without regard to Church Connections.

6. Chapter 152 of 6 Ed. VII (Dominion) (1906) still further lessened the charter restrictions imposed upon the membership of the Trustee Board by providing for the election by the graduates of five trustees "without regard to their Church connections."

Complete Severance from the Church. Nationalization of the University.

7. Finally by Chapter 138 of 2 George V (Dominion) (1912) the College freed itself absolutely from any Church control, abolished all religious tests and restrictions save the one that it should remain distinctively Christian, became national in constitution as well as in character and work, and assumed the name more in keeping with the facts—"Queen's University at Kingston." The Board of Trustees as now constituted included the Chancellor, the Rector, the Principal, a member appointed annually by the Governing Board of each affiliated College, six members elected by the University Council, six by the graduates, four by the benefactors, and twelve by the Board itself. (Provision for the inclusion of the Minister of Education and of an Assessor to be appointed by him was repealed by Chapter 141 of 4 George V (Dominion) (1914). There were added by Chapter 62 of 6-7 George V (1916) *infra* when the School of Mining and Agriculture was merged in the University, six trustees appointed by the Governors of that school and four more to be appointed by the Lieutenant-Governor in Council of Ontario.) The management and discipline of the University was expressly freed from all denominational restrictions. Its Faculty of Theology disappeared, to be succeeded at once by a separate institution, incorporated by Act of the Dominion Parliament assented to on the same day, under the name "Queen's Theological College," for which the Statute (Chapter 138) provided building accommodations and an endowment of \$200,000.00, both from the resources of the University, pursuant to an arrangement which recognized the sources from which the original endowment of Queen's was chiefly derived.

Complete Separation of the Theological College.

8. Chapter 139 of 2 George V (Dominion) (1912) incorporated Queen's Theological College above mentioned as the successor of the Faculty of Theology in Queen's College at Kingston, provided for a Board of Management, to be appointed by the General Assembly of the Presbyterian Church in Canada, defined the powers of this College, enabled it to confer degrees in divinity, and placed it in relation to the University as an affiliated body only.

FACULTY OF APPLIED SCIENCE.

SCHOOL OF MINING AND AGRICULTURE.

Incorporation. Affiliation of the School with the University.

1. By declaration filed pursuant to the Act respecting Benevolent, Provident and other Societies, the School of Mining and Agriculture was incorporated on the 5th of January, 1893, "for the training and education of students and more particularly of miners, prospectors, farmers, artisans, mechanics and workingmen, to whom instruction may be given in the various branches of chemistry, mineralogy, metallurgy, mining and assaying, in agriculture and related subjects, in veterinary science, in navigation, in civil, electrical and mechanical engineering and architecture, or any other departments of applied science."

In accordance with the plans of its incorporators the School was then organized and carried on in affiliation with the University.

Confirmation of Incorporation and Additional Powers Given.

2. By Chapter 115 of 56 Vic. (Ontario) (1893) this incorporation was confirmed, capital stock was provided for, powers to acquire and hold property, and other powers were conferred and municipalities were enabled to grant aid.

Additional Powers: Aid from the Province.

3. Chapter 44 of 1 Ed. VII (Ontario) (1901) declared that great and substantial benefits had resulted to the Eastern part of the province from the establishment of this School, granted certain additional teaching powers, made further provisions as to stock subscriptions and transfers, and to facilitate the giving of aid by township municipalities, and granted from the Consolidated Revenue Fund of the province \$22,500 per annum for five years towards the erection of buildings and carrying on of the work of the School.

(Relation of the facts concerning the various grants from the province to this School and to the University is not within the scope of this memorandum, but because the statute last cited is the only enactment dealing exclusively with this School which makes mention of contributions from the province it should be noted here that this School was established on an understanding reached with the then Premier of Ontario. Sir Oliver Mowat, that Provincial grants would be available; and that since that time the School has been in receipt of annual Government contributions which have gradually increased with the growth and needs of the institution.)

Addition to the Board of Governors and Representation by the Province.

4. Chapter 162 of 9 Ed. VII (Ontario) (1909) increased the capital stock of the corporation and provided for the addition of four Governors to be appointed by the Lieutenant-Governor in Council, four to be elected by the graduates and four to be appointed by the stockholders.

Amalgamation with and Merger in Queen's University. Faculty of Applied Science.

5. Chapter 110 of 6 Geo. V (Ontario) (1916) ratifies and confirms an agreement by the terms of which the School of Mining and Agriculture was amalgamated with Queen's University at Kingston and merged therein; the School becoming the Faculty of Applied Science of the University; its shareholders being added to the list of benefactors of the University; its assets becoming vested in, and its liabilities assumed by, the University; and provisions being also made for the addition of six trustees to the Board of Trustees of the University, to be appointed by the then Board of Governors of the School, and for the continuance of the right of appointment of four governors, as members of the Trustee Board, by the Lieutenant-Governor in Council. All the powers, rights and privileges of the School became vested in the University.

Amalgamation Confirmed by Dominion Parliament and Provision for Above-mentioned Additional Trustees.

6. By Chapter 62 of 6-7 Geo. V (Dominion) (1916) the Dominion Parliament confirms the same agreement of amalgamation and makes the necessary amendments in the Dominion Statute of 1912 to provide for the additional trustees named in the last paragraph.

FACULTY OF MEDICINE.

ROYAL COLLEGE OF PHYSICIANS AND SURGEONS.

Incorporation.

Chapter 137 of 29-30 Vic. (Province of Canada) (1866) incorporated "The Royal College of Physicians and Surgeons of Kingston," and granted it all the rights and privileges conferred on the colleges named in "The Medical Act for Upper Canada" or in any other Act referring thereto. Power was given to affiliate with any university having power to grant degrees in the province, and power was given for any such university to affiliate the college and to grant appropriate degrees.

Affiliation. Establishment of Medical Faculty.

Affiliation with Queen's followed at once, and this relation continued until 1892, when the Board of Trustees of the University appointed a Faculty of Medicine. This faculty, arising from the corporation mentioned, while now academically a constituent part of the University, nevertheless continued an independent administration of its finances subject only to certain stipulations it had given relating to the efficiency of equipment and maintenance. In 1902 some modification took place in this arrangement, and in 1913, the year following the final radical alteration in the University's constitution, the Medical Faculty amended its own constitution, threw in its lot completely with the University financially as well as academically, and was adopted and became, as it is now, an integral part of the University as the Medical Faculty of Queen's University at Kingston.

RECAPITULATION.

The University, originally closely linked with the Presbyterian Church, yet always holding its doors open to all denominations and numbering all denominations among its students and graduates, from time to time broadened the constitution of its governing body and relaxed the bond to the Church, in natural conformity with the growth of its own constituency and the rapid extension of its work and sphere of influence, until in 1912 it freed itself from the last vestige of Church control and became with its Faculties of Arts, Medicine and Science absolutely undenominational.

APPENDIX II.

REPLACEMENT VALUES OF BUILDINGS, FURNITURE AND EQUIPMENT.

Mechanical Laboratory, 6,960 sq. ft. floor area:

Cost, 1907	\$7,375 62	
Value, 1914	9,219 52	
Value, 1920		14,751 24
Equipment		8,600 00
Total		\$23,351 24

Grant Hall, 10,300 sq. ft. floor area:

Cost, 1905	45,115 44	
Value, 1914	56,394 05	
Value, 1920		112,788 10
Furniture		10,000 00
Total		122,788 10

Carruthers' Hall, 14,520 sq. ft. floor area:

Cost, 1912	29,504 69	
Value, 1920		59,009 38
Equipment		8,000 00
Total		67,009 38

Skating Rink, 17,000 sq. ft. floor area:

Value, 1912	9,500 00	
Present value		12,000 00
Total		12,000 00

Curling Rink:

Value, 1912	7,342 42	
Present value		8,000 00
Total		8,000 00

Observatory:

Cost, 1912	6,113 92	
Present value		12,227 84
Equipment		2,000 00
Total		14,227 84

Old Medical Building, 11,400 sq. ft. floor area:

Cost with rebuilding, 1901	18,000 00	
Value, 1914	22,500 00	
Present value		44,500 00
Furniture and equipment		15,000 00
Total		59,500 00

Old Arts Building, 23,400 sq. ft. floor area:

Cost, 1880	\$52,422 31	
Value, 1914	65,552 88	
Value, 1920		\$131,105 76
Furniture		10,000 00
Books		400,000 00
Botany Dept., equipment		4,000 00
Museum Specimens		20,000
Total		\$565,105 76

New Arts Building, 35,430 sq. ft. floor area:

Cost, 1904	69,944 23	
Value, 1914	87,430 29	
Value, 1920		174,860 58
Furniture		10,000 00
Total		184,860 58

Nicol Hall, 14,200 sq. ft. floor area:

Cost, 1913	70,374 20	
Value, 1920		140,748 40
Furniture		5,000 00
Equipment		20,000 00
Total		165,748 40

Central Plant:

Cost, 1904	22,360 62	
Value, 1920		50,500 00
Total		50,500 00

Fleming Hall, 30,400 sq. ft. floor area:

Cost, 1904	61,000 00	
Value, 1914	76,250 00	
Value, 1920		152,500 00
Furniture		4,000 00
Electrical equipment		15,000 00
Mechanical equipment		14,200 00
Total		185,700 00

Ontario Hall, 41,200 sq. ft. floor area:

Cost, 1904	81,000 00	
Value, 1914	101,250 00	
Value, 1920		202,500 00
Furniture, Physics Dept.		5,000 00
Equipment, Physics Dept.		25,000 00
Furniture, Geological Dept.		3,000 00
Equipment, Geological Dept.		4,000 00
Geological Museum		30,000 00
Mineralogy Dept., furniture		3,000 00
Mineralogy Dept., equipment		4,000 00
Total		276,500 00

Chemistry Building, 28,000 sq. ft. floor area:

Cost, 1913	120,459 57	
Value, 1920		240,919 04
Office furniture		1,000 00
Equipment		15,000 00
Total		256,919 04

New Medical Building, 12,900 sq. ft. floor area:

Cost, 1908	62,000 00	
Value, 1914	67,500 00	
Value, 1920		135,000 00
Furniture and equipment		35,000 00
Total		170,000 00

Mining Mill (wooden building), 6,800 sq. ft. floor area:

Cost, 1894	14,829 93	
Value, 1920		10,000 00
Equipment		7,500 00
Total		17,500 00

Gymnasium, 11,000 sq. ft. floor area:

Cost, 1905	\$29,000 00		
Value, 1914	36,250 00		
Value, 1920		\$72,500 00	
Equipment		10,000 00	
Total			\$82,500 00

Cafeteria, 5,000 sq. ft. floor area:

Present cost	7,000 00		
Equipment		3,000 00	
Total			10,000 00

Residences, 25,000 sq. ft. floor area:

Original cost, estimated	24,000 00		
Value, 1914	30,000 00		
Value, 1920		60,000 00	
Total			60,000 00

Value of Land.

Assessed at \$148,250.00.

Actual value about 222,375 00

Total value of Land, Buildings and Equipment.....\$2,554,585 34

APPENDIX III.

AMOUNT AND NATURE OF THE ENDOWMENT.

The Endowment of Queen's University at present amounts to \$1,791,495.12.

Of this sum about \$1,000,000 is invested in bonds and debentures and the rest in mortgages.

The following statement shows the sources of the endowment. The contributions for the most part have been in small sums from persons of limited means:

<i>Source or Object.</i>	<i>Date.</i>	<i>Amount.</i>
Michie	1867-1884	\$ 6,000 00
New Chair in Theology	1867	1,163 22
Watkins' Bequest	1877	4,000 00
Kingston Ladies' Scholarship	1878	707 00
Robert Sutherland	1878	11,738 66
Spence Bequest	1881	3,427 70
Greenshields Bequest	1883	5,000 00
Sir John A. Macdonald Chair	1889	22,558 90
Nichols Bequest	1891	20,000 00
Fulton Bequest	1892	3,000 00
Roberts Bequest	1893	40,000 00
Doran Bequest	1893	22,384 31
Malloch Bequest	1894	2,000 00
Five Years Fund	1896	23,539 92
Robert Waddell Tutorship	1898	2,500 00
Mental Philosophy	1899	5,681 28
Gowan Fellowship	1900	250 00
Century Fund	1901	35,893 33
'01 Fellowship	1903	1,938 08
1904 Endowment	1904	433,583 64
Jubilee Fund	1904	185,728 83
Fleming Coal Mine	1904	931 40
Chair in Botany	1905	3,000 00
British Columbia Scholarship	1905	115 00
Wallbridge	1906	1,000 00
Moral Philosophy	1906	50,000 00
Mrs. Jane Hunter	1906	2,000 00
Dufferin County Scholarship	1910	50 00

	Date.	Amount.
James Gillies—Arts	1910	\$1,000 00
James Gillies—Theology	1910	1,000 00
Douglas History	1911	50,000 00
		<hr/>
		\$940,191 27
Less transferred to Theological College at Separation		200,000 00
		<hr/>
		\$740,191 27
School of Mining	1913	68,273 96
Douglas Pharmacy	1913	20,000 00
Longwell	1913	5,000 00
Nicol Hall subscriptions	1913	
	(to date)	721 92
Grant Hall, subscriptions		65 00
Not specified		685 55
Hoffman	1918	35,000 00
Interest on Douglas Endowment		5,468 75
1918-1919 Endowment		902,368 67
Hoffman	1919	3,500 00
Augmented Revenue		220 00
Douglas—Colonial History		10,000 00
		<hr/>
		\$1,791,495 12

APPENDIX IV.

REVENUE AND EXPENDITURE.

INCOME.

NOTE: The smaller income for 1919-20 in comparison with the estimated income for 1920-21 is due chiefly to the fact that part of the new Endowment Fund was received too late to give an interest yield in 1919-20. The financial year of the University extends from April 1 to March 31.

	1919-20 (Actual)	1920-21 (Estimated)
<i>Income from Students.</i>		
Arts—		
Intra-mural	\$23,906 18	\$22,565 00
Extra-mural and Summer School ..	28,326 65	30,000 00
Applied Science	48,491 00	50,000 00
Medicine	27,943 46	29,520 00
Banking	15,438 50	12,000 00
Graduation (all Faculties)	997 48	1,000 00
	<hr/>	<hr/>
	\$145,103 27	\$145,085 00
<i>Income from Investments:</i>		
Bonds, etc. (less Bank interest and scholarships)	\$30,204 23	\$45,000 00
Mortgages	52,203 77	57,000 00
Jubilee Fund	3 00	84 00
	<hr/>	<hr/>
Less cost of collection	\$5,099 38	\$5,000 00
	<hr/>	<hr/>
	77,316 62	97,084 00
<i>Income from Grants by Province:</i>		
Arts	43,000 00	43,000 00
Science	67,000 00	67,000 00
Medicine	15,000 00	15,000 00
War Grant		40,000 00
	<hr/>	<hr/>
	125,000 00	165,000 00
<i>Income from Other Sources:</i>		
School of Navigation	603 68	
O'Brien Co., Ltd.	4,875 00	4,875 00
Rents (including Hospital Commission)	7,140 52	3,000 00
	<hr/>	<hr/>
	12,619 20	7,875 00
	<hr/>	<hr/>
	\$360,039 09	\$415,044 00

EXPENDITURE.

The estimated expenditure for the current year is based upon actual expenditure for the eight months from April 1 to November 30.

	1919-20. (Actual)	1920-21 (Estimated)	
<i>Departmental Expenses: Teaching, Research, Laboratory and other supplies:</i>			
<i>Salaries—</i>			
Winter Session	\$195,866 63	\$245,983 00	
Ordinary Summer Session	4,581 52	4,093 00	
Special Summer Session (Science) ..	17,000 00	.....
Douglas Tutorship	1,219 25	1,200 00	
Annuities .....	.....	3,586 00	
	<u>\$218,667 40</u>	<u>\$254,862 00</u>	
<i>Expenses of Departments—</i>			
Art	206 72	500 00	
Botany	185 80	750 00	
Chemistry	12,707 54	15,000 00	
Civil Engineering	1,590 89	2,500 00	
Electrical Engineering	423 96	1,500 00	
Mechanical Engineering	954 95	1,000 00	
Geology	134 57	400 00	
Medicine	12,703 40	16,000 00	
Mining and Metallurgy	7,500 35	8,000 00	
Mineralogy	524 42	750 00	
Physics	4,864 64	5,000 00	
	<u>41,797 24</u>	<u>51,400 00</u>	
Research	6,216 67	7,500 00	
<i>Libraries: (Books)</i>	7,296 31	7,600 00	
<i>Administration:</i>			
Salaries (including Librarian)	27,417 90	30,000 00	
Advertising	2,529 71	3,300 00	
Printing and Stationery	11,400 00	11,750 00	
Stamps	3,599 50	4,000 00	
	<u>44,947 11</u>	<u>49,050 00</u>	
<i>Operation and Maintenance of Plant:</i>			
<i>Central Plant—</i>			
Salaries	3,120 00	4,000 00	
Light, heat and power	14,286 10	31,000 00	
Janitors, etc.	9,334 00	11,000 00	
Observatory (light and fuel)	173 50	175 00	
Grounds	1,010 48	2,000 00	
Taxes	1,622 26	2,357 00	
Insurance	4,198 00	4,500 00	
Repairs	15,400 72	15,000 00	
	<u>49,145 06</u>	<u>70,032 00</u>	
<i>Miscellaneous:</i>			
Travelling	3,142 16	6,000 00	
Contingencies	2,858 71	7,500 00	
Athletics	770 50	2,000 00	
	<u>6,771 37</u>	<u>15,500 00</u>	
	<u>\$374,841 16</u>	<u>\$455,944 00</u>	
Deficit	\$14,802 07	\$40,900 00	

APPENDIX V.

NUMBER OF FACULTIES AND OF STUDENTS IN EACH FACULTY.

(The statement below does not include the affiliated institutions—Queen's Theological College, Dairy School, or School of Navigation—but only the three Faculties maintained out of the University Budget).

SESSION 1920-21.

Faculty of Arts:		
Intra-mural (including Summer School)	660	
Extra-mural	592	
Banking	360	
		1612
Faculty of Applied Science	396	
Faculty of Medicine	240	
		2,248
Less registered in two faculties		9
Total		2,239

APPENDIX VI.

COST PER STUDENT IN EACH FACULTY.

There are many different ways of making such an estimate, and widely differing results are to be obtained, according to the method employed. A charge against a student's education might include only salaries and administrative expenses, or it might add complete overhead costs for maintenance of the Plant, or it might even take into account the interest on the total investment in Buildings, Land and Equipment, and the interest on the endowment. The total cost may, therefore, be made very large or very small.

The method employed in the present calculation is to charge against the student's education the total operating expenses of the year. In the financial statement exhibited above under *Revenue and Expenditure*, the expenses of the last financial year are shown to be \$374,841.16. This, then, is what it cost Queen's University last year to provide educational facilities for the students registered in the three Faculties of Arts, Science and Medicine.

The next problem is to apportion costs to the three Faculties. This is particularly difficult at Queen's, since by a very economical arrangement, to avoid duplication of equipment, no fewer than twelve Departments serve two or even three of the Faculties. The Department of Chemistry, with its own building, for example, provides instruction for students in Arts and Medicine as well as in Applied Science. It is very difficult to estimate what part of salaries or equipment or maintenance should be charged against each Faculty. A charge based on the mere number of students from each Faculty would give very misleading results.

The following table shows the calculations made by Mr. R. Easton Burns, C.A., regarding distribution of costs for 1919-20:

	Total.	Total cost	Net cost per student deduct- ing av'ge fees.
Faculty of Arts	\$157,623 94	\$180 00	\$130 00
Faculty of Applied Science	*144,341 60	337 00	222 00
Faculty of Medicine	72,875 62	318 00	193 00
Total expenditure, 1919-20	\$374,841 16		

APPENDIX VII.

THE COST OF ADMINISTRATION.

The cost of administration for 1919-20 was \$44,947.11, or about 12% of the total expenditure. The details are shown under *Revenue and Expenditure* above.

*This sum includes a special expenditure of \$17,000 for a Summer Session for returned men in the Faculty of Applied Science.

APPENDIX VIII.

THE SCALE OF PROFESSORIAL AND ADMINISTRATIVE SALARIES.

Including a special bonus for 1920-21, the présent range of salaries is as follows:

Administrative: Principal, \$10,000; Vice-Principal, \$750, in addition to his salary as Professor; Deans, \$500, in addition to their salaries as Professors; Registrar and Treasurer (one officer), \$4,500; Deputy Registrar, \$1,800; Bookkeeper, \$1,500; Librarian, \$1,700; Assistant Librarian, \$1,100; typists and stenographers, from \$8 to \$18 a week, averaging \$12 a week; janitors and caretakers, \$14 to \$21 a week, averaging \$18 a week.

Professorial: Professors who are heads of Departments, \$3,500-\$4,000; Professors not heads of Departments, \$3,000-\$3,200; Associate Professors, \$2,500-\$2,900; Assistant Professors, \$2,000-\$2,500; Lecturers, \$1,600-\$2,100; Demonstrators, Fellows, Tutors, \$100-\$1,200.

Not included in the above are two Professors in the Faculty of Medicine who are each receiving \$5,000.

APPENDIX IX.

WHO QUEEN'S STUDENTS ARE.

A very small proportion of Queen's students come from homes of wealth. One of the distinctive services of the University has been to provide education at a relatively low cost for hundreds of young men and women from homes of moderate means. An analysis of the occupations of parents of students in the entering class of this year gives the following information:

Sons and daughters of farmers	70
Sons and daughters of professional men and officials of small means, like ministers, teachers, clerks, bookkeepers	103
Sons and daughters of men who work with their hands, like carpenters, blacksmiths, cheesemakers, tailors	72
Sons and daughters of merchants (grocers, druggists, etc.)	47
Parents' occupations not given	25
From homes of moderate wealth	7

 334

APPENDIX X

FACULTY OF APPLIED SCIENCE

GRADUATES SINCE 1900

For the significance of this Table see page 27

Date	Mining	An. & Ap. Ch.	Chem. Eng.	Ch. & Mineralogy	Min. & Geol.	Civil	Mechanical	Electrical	Power	San. Eng.	Physics
1900.....	2				1	1					
1901.....	2					1					
1902.....	5			3	3			3			
1903.....	12			4	2	1		2			
1904.....	8			2	2	4		2			
1905.....	7					7	1	6			
1906.....	7				2	1	1	7			
1907.....	13					15	1	6			
1908.....	10				4	10	1	7			
1909.....	12		1**	2	4	10	3	8	2	1	
1910.....	14		1		2	10	2	13		2*	
1911.....	15			3	5	8		8	2		
1912.....	29		1	3	2	21	2	4	3		
1913.....	13			1*	1	28	8	6	1*		
1914.....	9		2			22	7	13			
1915.....	4		1		1	29	1	7			
1916.....	3		1			21	2	4			
1917.....	3					17	4	2			
1918.....			4			8	1	2			
1919.....	1	1	4			11	3	4			
1920.....	4	3	6		1	9	3	3			1**
	173	4	22	18	30	234	40	107	8	3	1

Total number of graduates, 640.

PRESENT REGISTRATION, 1920-21

Year	Mining and Metallurgy	Anal. and App. Chem.	Mineralogy and Geol.	Chem. and Metallurgy	Civil	Mechanical	Electrical	Physics
4th.....	5	1	1	7	12	5	6	1
3rd.....	19		1	21	14	4	7	3
2nd.....	25	6		33	28	22	35	
1st.....	10	12	1	26	19	21	39	1
	59	19	3	87	73	52	87	5

No courses indicated, 10.
Special courses, 2.
Total number registered, 1920-21, 397.

* Courses discontinued.
** New course.

APPENDIX XI.

MEDICAL FACULTY (only).

1900 TO DATE.

From:—

	Source of Students.	Distribution of Students.
Ontario	813	419
Quebec	22	19
Manitoba	14	21
Saskatchewan	61	72
Alberta	20	36
British Columbia	8	25
Prince Edward Island	4	1
Nova Scotia	13	10
New Brunswick	11	10
Newfoundland	10	10
United States	24	129
West Indies	46	20
British Guiana	10	7
Other Countries	16	30
Total	1,072	806

	Cities.	Towns.	Rural Districts.
Sources of Ontario students	289	147	377
Distribution of Ontario graduates	154	107	158

APPENDIX XII.

QUEEN'S REMARKABLE GROWTH.

That Queen's University has an assured future as an educational institution is made clear by the following figures, showing the increase in number of students since 1890:

Naturally the registration was greatly reduced during the years of the war, but the figures for this session and the last show that the remarkable growth interrupted by the war has been resumed. Notwithstanding the loss of the Faculty of Education, the registration for the present session is 250 above that for 1914-1915, the high point reached at the outbreak of the war.

<i>Session.</i>	<i>Registration.</i>
1889-1890	419
1899-1900	665
1910-1911	1,612
1914-1915	1,997
1915-1916	2,009
1916-1917	1,316*
1917-1918	1,227*
1918-1919	1,425
1919-1920	2,703
(including special Summer Session in Science for returned men)	
1920-1921	2,247
(first year without the Faculty of Education)	

The same story of steady growth is told by the following table, which shows the number of degrees conferred in the three Faculties of Arts, Science and Medicine since 1880.

* Years when the Great War reduced attendance.

GRADUATING CLASSES.

	M.A.	B.A.	B.Sc.	M.D.	M.B.	Total.
1880	3	6	...	13	...	22
1890	17	23	...	39	...	79
1900	15	47	4	21	...	87
1901	10	50	3	24	...	87
1902	19	60	15	31	...	125
1903	15	65	17	48	...	145
1904	18	62	18	42	...	140
1905	23	66	20	39	...	148
1906	22	67	18	47	...	154
1907	14	90	35	32	...	171
1908	20	85	34	48	...	187
1909	17	68	43	39	...	167
1910	24	83	42	35	...	184
1911	22	94	42	49	...	207
1912	19	80	66	23	27	215
1913	17	151	59	11	33	271
1914	12	144	62	27	54	299
1915	10	147	40	18	75	290
1916	7	100	26	34	73	240
1917	5	81	25	13	1	125
1918	4	85	14	38	...	141
1919	7	119	11	16	...	153
1920	19	112	30	58	...	219

The number of degrees grew steadily till 1914. For the next two years, as a result of the war, there was a falling off, but the last three years show a rapid increase, and there is no doubt that in two years more the University will be graduating larger classes than in 1914.

APPENDIX XIII.

QUEEN'S SERVICE TO THE PROVINCE.

The Province of Ontario should give adequate financial assistance to Queen's University because of her large contribution to the schools of the Province.

From the last report of the Minister of Education for the Province of Ontario the following facts have been collected:

Inspectors

Graduates of Queen's	58
Graduates of all other Universities	49

Staffs of Collegiate Institutes

Graduates of Queen's, including 14 Principals	146
Graduates of Toronto, including 25 Principals	272
Graduates of Western	3

Staffs of Collegiate Institutes, excluding Toronto

Graduates of Queen's, including 14 Principals	127
Graduates of Toronto, including 19 Principals	182
Graduates of Western	3

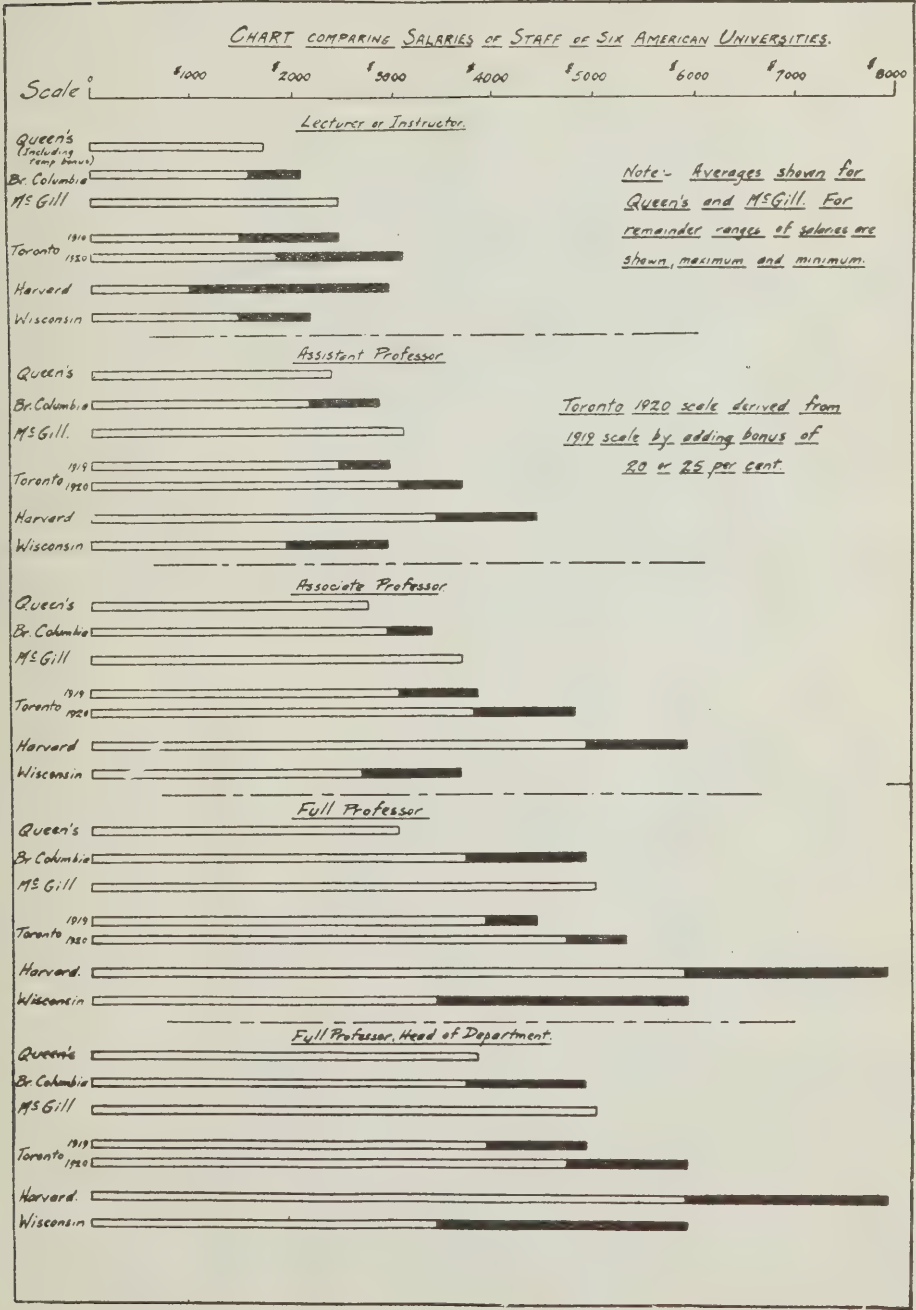
Staffs of High Schools

Graduates of Queen's, including 44 Principals	140
Graduates of Toronto, including 60 Principals	194
Graduates of Western, including 1 Principal	8

Staffs of Continuation Schools

Graduates of Queen's, including 26 Principals	37
Graduates of Toronto, including 11 Principals	23
Graduates of Western, including 1 Principal	1

The above statement shows that Queen's leads in the case of Inspectors and teachers in Continuation Schools, and contributes more than her proper proportion to the High Schools and Collegiate Institutes of the Province.



APPENDIX VII

STATEMENT OF WESTERN UNIVERSITY

INFORMATION CONCERNING THE FACULTY OF ARTS

COLLEGE OF ARTS.

Like all the other universities of Ontario, the Western University owes its origin to the need of educational facilities for students in Divinity. Huron College, founded in 1867, was the training school for the Anglican clergy of the Diocese of Huron. At the suggestion of the Council and the Alumni of Huron College, Bishop Hellmuth procured, in the year 1878, from the Ontario Government a charter for a University to be known as the Western University of London, Ontario. The first meeting of the Senate as constituted by the Act was held on May 1, 1878, and an energetic campaign for the raising of funds in Canada and England was at once prosecuted by the Bishop. The intention being to combine the Faculties of Arts and Divinity under one management, the Principal of Huron College became ex-officio Provost of the Western University. The property of the former was handed over in trust to the Senate, and the Hellmuth Boys' College, with the whole square, on the corner of which St. John's Church now stands, was purchased for the use of the combined institutions. On October 6, 1881, the University opened its classes. In June following, a Medical Faculty was formed by twelve of the leading physicians in the city, and entered into affiliation with the University, proper accommodations having been provided in the building. Until 1884 the financial prospects were encouraging. Considerable sums were raised by the energetic Bishop Hellmuth, and only about \$19,000 of the purchase price of the University remained on mortgage. But in that year a disaster befell the young institution. The guiding and sustaining hand of Bishop Hellmuth was withdrawn when he removed to England and resigned the Chancellorship. Subscriptions ceased to flow in, and the Senate decided to put the property up for sale and remove the classes to the old Huron College Building. Then followed another blow when the Huron College Council, in alarm, withdrew from affiliation with the University. It was found necessary to close the doors to students in Arts. For ten years the Senate continued to meet occasionally and struggle with their difficulties; but they were unable to avert the loss of nearly all their property when, in 1894, they were obliged to hand it over to the Star Life Assurance Co., which held the mortgage.

During the ten years following the resignation of Bishop Hellmuth in 1884, the work of the Arts Department was suspended. In 1886 the Middlesex Law Society established a school in affiliation with the University for the teaching of Law to students seeking admission to the legal profession. A staff of able lawyers gave their lectures free, and for a time the undertaking promised well. But when the Law Society of Ontario refused to accept the results of any examinations except their own, the attendance at the lectures fell off, and in two years the effort was abandoned. During these ten years the Faculty of Medicine remained in active and successful operation.

In the meantime, the authorities of Huron College had become convinced that without an Arts Department it would be impossible to maintain a Divinity School. The Council of the College, and finally Bishop Baldwin, were now disposed to make concessions, and in September, 1895, a new affiliation was entered into, thus enabling the Senate to revive the Arts Department.

Now follows a period of thirteen years during which the University maintains a desperate struggle for existence. Its denominational character excluded it from civic or provincial support. On the other hand, though the members of the Senate were Anglicans, it had no organic connection with the Synod of the Diocese, and could not receive the official sanction and support of the Anglican Church. One financial agent after another was sent out to canvass for funds, but in spite of the strictest economy each year showed a deficit in the finances. Gradually the conviction grew stronger, especially among the lay members of the Senate, but all connection with the Church must be given up. At length the most determined opponents of the movement had to yield to the logic of facts, and it was decided to seek such legislation as would enable the Council of the City of London to make the University an annual grant. Conditionally upon the making and continuing of this grant, the Senate adopted a new constitution, legalized by Act of the Provincial Legislature, April, 1908. By this Act the control of the University is vested in a Board of Governors, consisting of four members nominated by the Government, four by the City Council, and four chosen by these eight.

This placing of the University on an undenominational basis opened a new and more prosperous era in its history. Not only has the City of London more than fulfilled its original agreement, but the Province has aided the institution directly and

indirectly. The Hygienic institute, with its excellent building and equipment, was placed under the control of the Board of Governors, and is now a Faculty of the University. In 1914 the Government first recognized the claims of the Western to a measure of provincial support by making it an annual grant of \$10,000,000. With these added resources the University has been able to make great improvements in its general equipment. A dozen new members have been added to the staff of the Arts Department alone. Physical, Geological and Biological Laboratories have recently been installed. The Library, in addition to a liberal annual grant for the purchase of new books, has been singularly fortunate in receiving a donation from the well-known bibliophile, Dr. Barnett, his valuable collection of over forty-five thousand volumes.

AFFILIATION.

Three colleges are formally affiliated with the Western University in accordance with an article in the University's Act of Incorporation.

The original relation of Huron College and the University is now reversed, the College now being affiliated to the University. The students enrolled in the former institution take certain courses in the College of Arts concurrently with their theological courses, graduating in both Arts and Theology after a term of years.

In the autumn of 1919 two Catholic Colleges entered into affiliation. These, unlike Huron College, are engaged in the teaching of Arts subjects. One of these institutions, a college for men, is situated at Sandwich, Ontario; the other, a college for women, at Chatham, Ontario. The authorities of both have purchased plots totalling forty acres adjoining the new campus of the Western University, and purpose building as soon as the University begins the erection of its buildings. Indeed, the Ursuline College of Chatham will move its Arts Department to London in the summer of 1921, occupying temporary accommodation until its new buildings are completed. These two Catholic colleges have enrolled this year fifty freshmen, who, in virtue of affiliation, are students of the Western University. With the single exception of the special concessions in History and honor Philosophy made for Catholic institutions, the agreements of affiliation are such that any other Arts College can be affiliated on the same basis. The model followed in this respect is the arrangement made by Act of Parliament of the Province of Ontario between the University of Toronto and St. Michael's College, Toronto.

SUMMER SESSION OF THE COLLEGE OF ARTS.

In July and August of 1918 the first Summer School of the College of Arts was opened. The enrolment was sixteen. In 1919 the number was increased to twenty-four, and in 1920 to thirty-five. Seventy-five per cent. of the students attending these sessions are teachers who may be classified thus: those who are entering upon University work for the first time, those who are aiming to qualify for more advanced certificates of the Department of Education, University graduates who desire to take certain subjects which they were unable to take while undergraduates.

UNIVERSITY EXTENSION.

For several years the Faculty of Arts have had an Extension Committee, which has arranged for a series of popular lectures to be delivered during the winter months in London and outside points. The speakers have been in large part members of the staff, the minority being visitors from other institutions in other places. The lectures have numbered from sixteen to twenty per year. This year, in answer to a strong demand, the programme is to be extended, and, among other additions, lectures and courses for workmen are to be given in collaboration with the Trades and Labor Council of London. It is also planned to include lectures and demonstrations on music and the fine arts in the courses offered to the general public.

At the beginning of the present year the Extension Committee of the Faculty of Arts has united with the corresponding committees of the Faculties of Medicine and Public Health to form a University Extension Board, which is to have oversight over the activities of all three committees to facilitate the exchange of professors among the extension courses of the faculties, and to formulate plans for systematic expansion, so as to enable the University to serve as adequately as possible all districts and classes of its constituency.

LIBRARY FACILITIES IN GENERAL.

The Library Board of the Western University, under the guidance of its Chairman, Dr. C. C. Waller, has a strong and progressive policy which is being put into effect with unusual directness and vigour. The Chief Librarian is a University graduate who has

been trained in a Library School; one of her assistants has also received special training; while the others have had practical experience covering two or three years. The staff are engaged in classifying and cataloguing, according to the best approved modern system, all the books in the possession of the University. Six thousand volumes have already been dealt with.

In addition to the books in the Barnett Library there are about thirteen thousand in the College of Arts, School of Medicine, Institute of Public Health and Huron College, the affiliated Divinity School of the Anglican Diocese of Huron. This makes a total of sixty thousand volumes available in the University. Also at the disposal of students are the forty-five thousand books in the Public Library of the City of London.

The Library is one feature of the University in which the citizens are showing a genuinely practical interest. Recently several citizens have promised to give their libraries, most of them unique in some particular, as soon as arrangements can be made for the actual transfer. Thought is now being given to the possible acquisition by the University of a part of the library of the late Mr. Shenley, the Engineer of the Hoosac Tunnel, whose home is close to London, and of the very valuable Whitman library left to the members of his family by the late Dr. Bucks, Walt. Whitman's literary executor, who was a resident of London for many years.

NOTE.—Since the foregoing paragraphs were written, the Carnegie Institution has decided to make the Western University a depository of all of its publications.

BARNETT LIBRARY.

The figures relating to the Barnett Library represent only the original cost of the books. No attempt has been made to put a market valuation upon the collection, although it contains hundreds of rare volumes and pamphlets which, if put upon the market, would be readily sold at high prices.

The Barnett Library was presented to the Western University in 1918 by Mr. J. Davis Barnett, of Stratford, Ontario, who was for many years Mechanical Superintendent of the Grand Trunk Railway. Mr. Barnett, now a man in his seventieth year, has made the collection of this Library the main object of his thought and effort for sixty years, and so broad has been his view of the field of human knowledge and so discriminating his judgment, that the Library is of genuine service to scholars in virtually all departments of study.

Certain sections of the Library, however, are almost unique in their completeness; the collection of Shakespeariana, for instance, is the best in Canada, and is very favourably known in other countries. Again, in respect of Canadiana, the Barnett Library ranks high among Canadian collections, including even those in the Parliament Buildings of the various Provincial Capitals.

RESEARCH.

Several members of the staff of the College of Arts are engaged in research and publication in addition to teaching.

Professor A. D. Robertson is conducting special investigations into the breeding of oysters for the Fisheries Department of the Dominion Government.

Professor N. C. Hart is investigating certain problems in plant physiology, especially in their bearing upon Economic Botany.

Professor E. G. Sturdevant will shortly publish a monograph on a certain phase of physical and electro-chemistry, the work having a special relation to industrial chemistry.

Professor J. W. Russell is a practical Geologist, having been engaged for years in operating silver mines with success in the Cobalt district.

Professor W. F. Tamblin is a prolific investigator and writer in the field of English literature.

Professor Fox publishes frequent original articles in the Field of Classical Archaeology and Literature.

Professor Dorland has just contributed to a large volume on the History of the British Empire.

Mr. Fred Landon is doing diligent and brilliant research work in American and Canadian History, especially in the field where the United States and Canada have had a pronounced influence upon each other.

Professor L. P. Shanks has recently published a critical volume of great worth upon Anatole France, and has already secured a publisher for a two-volume work upon Balzac. He contributes critical essays frequently to the literary magazines of the best class.

The literary and historical productions of the staff are made possible through the strong Library equipment of the University.

BUILDINGS OF THE COLLEGE OF ARTS.

Since the time the College of Arts originated in Huron College the former has been housed in the buildings of the latter. When, however, the College of Arts became non-sectarian, the legal relations of the two institutions under the same roof were changed. From that time onward Huron College has played the role of the landlord, renting various portions of its building to the Western University, with the result that at the present time it occupies only one-sixth of its own property. Both institutions are greatly hampered for lack of room.

ANNEX.

Owing to lack of space for many collegiate purposes in the Huron College buildings the Board of Governors have purchased, since the beginning of the term of 1919-20, a building on St. James' Street, about two hundred yards distant from the College property. This is known as the Annex. Here are now located the offices of the Librarian and the Faculty Supervisor of Athletics, the Library (with increased stack space), Library work-room, two or three classrooms. The acquisition of this property was imperative, even if it is to be occupied no more than a year and a half.

NEW CAMPUS.

The new Campus is a tract of two hundred acres situated about half a mile from the northern limits of the city. A street car line runs within a short distance of it. If a right of way can be secured at a certain point and the river bridged, it will be possible for one to reach the building in less than ten minutes after dismounting from the Richmond Street car. The Campus area lies on the north bank of the north branch of the River Thames, and slopes gradually to the water's edge. It is well wooded with pine and hardwood, and will lend itself to attractive landscape development. It is agreed by many that naturally it is the best Campus site in Eastern Canada. Forty acres of it are at present under lease to the London Hunt and Country Club, being used for golf.

A detailed survey of this area has been made and profiles taken and charted. Moreover, an expert architect has laid out a scheme for the relative location of all the buildings that will be required by the University for the next two centuries. It is the conviction of the present administration that this plan will prevent the disorderly and haphazard arrangement of buildings which has made so many university campuses unattractive and inconvenient. It is felt, too, that the choice of College Gothic architecture for the first buildings will establish a form of architectural style which succeeding administrations will follow, and thus insure a pleasing uniformity among all the buildings of the University.

NEW BUILDINGS OF THE COLLEGE OF ARTS, WESTERN UNIVERSITY.

The style of architecture of the new buildings to be erected on the Kingsmill Farm is the Collegiate Gothic. It is planned to erect at the outset at least two buildings—one for the administration, library, staff offices and classrooms for non-laboratory subjects, one for the four natural sciences. Plans for the first buildings are now being drawn, but no satisfactory exterior has yet been suggested.

The plans for the Science Building, with the exception of the front elevation, are practically complete, and the members of the Science staff are now engaged in plotting the arrangement of tables, benches, apparatus, etc.

GRANT OF THE COUNTY COUNCIL OF MIDDLESEX.

On June 8 the Council of the County of Middlesex granted the sum of \$100,000 to the Western University toward the erection of the new buildings of the College of Arts. The gift is to be recognized by the placing of a tablet in the entrance of the new main building bearing the names of the Middlesex soldiers and nursing sisters who died in the Great War. This gift is significant chiefly in that it marks the beginning of the official co-operation of the counties with the City of London and the Ontario Government in the development and maintenance of the Western University. There is no reason to doubt that this action will be an example to the other counties of Western Ontario.

PRESENT SALARY SCALES IN THE ARTS FACULTIES OF CERTAIN CANADIAN UNIVERSITIES.

<i>Western:</i>		Maximum.	Minimum.	Average.	Median.
Professor	.....	\$3,000	\$2,300	\$2,512	\$2,600
Associate Professor	.....	2,500	2,000	2,250	2,250
Assistant Professor	.....	.....	.....	.....	.....
Instructor	.....	2,100	1,500	1,843	1,800
<i>Toronto:</i>					
Professor	.....	5,000	4,000	.....	4,500
Associate Professor	.....	4,000	2,000	.....	3,000
Assistant Professor	.....	.....	.....	.....	.....
Lecturer	.....	2,500	1,500	.....	2,000
<i>Queen's:</i>					
Professor	.....	4,000	3,500	.....	3,750
Associate Professor	.....	3,500	2,500	.....	3,000
Assistant Professor	.....	.....	.....	.....	.....
Lecturer	.....	2,400	2,000	.....	2,200
<i>McGill:</i>					
Professor	.....	.....	.....	3,900	.....
Associate Professor	.....	.....	.....	3,000	.....
Assistant Professor	.....	.....	.....	2,500	.....
Lecturer	.....	.....	.....	1,700	.....
<i>British Columbia:</i>					
Professor	.....	5,000	3,500	.....	4,250
Associate Professor	.....	3,500	2,750	.....	3,125
Assistant Professor	.....	2,750	1,500	.....	2,125
(of instructorial grade).					
Instructor	.....	1,500	1,000	.....	1,250
(of assistant's grade).					

INFORMATION CONCERNING THE WESTERN UNIVERSITY MEDICAL SCHOOL

HISTORICAL.

At the suggestion of the late Bishop Hellmuth, at that time Chancellor of the Western University, the Medical Department of the Western University was organized in May, 1881. The school first opened on October, 1882, with thirteen students.

The University was unable to offer or obtain suitable working quarters for the new school, so that after a few years of instruction given in a five-room cottage the teachers themselves built the old school building on the corner of York and Waterloo Streets, meeting a part of the cost with students' fees and subscribing the rest themselves.

From its foundation up to the present time the Medical School has been a bona-fide department of the University, although no contributions for maintenance or support were obtained from the University until recent years. The first graduate from the University was from the Medical Department, and for several years this was the only department of the University in actual operation. Continuously from its foundation the Medical School has had available for teaching the material in the wards of the General Hospital, now Victoria Hospital.

In 1910 the Institute of Public Health was built by the Ontario Government to provide facilities for work particularly in Public Health. This Institute was opened to the students of the Medical Department of the Western University, beginning with the Session of 1911-1912, and since that time all courses in Chemistry, Pathology, Bacteriology and Public Health have been given there. Since its foundation the Institute has been an integral part of the University; its affairs have been administered by a committee of the Board of Governors, and funds for its maintenance and development have been provided by the Provincial Government.

In 1913 the Medical Department was reorganized, becoming, in fact, the Faculty of Medicine of the Western University, the Senate of the Western University being responsible for the work of the Faculty of Medicine, and the Board of Governors responsible for the financial affairs of the School. In the same year full-time professors were appointed in several departments. The number of full-time men has been increased so that in October, 1920, there will be six or seven instructors of professional rank engaged in the instruction of medical students (professors in charge of Physics, Chemistry and Biology are not thus included). The new building for the Medical School now under construction will provide thoroughly modern laboratories and adequate equipment for all of the work.

The Library of the Medical School, now well begun, will be provided with ample space and reasonable funds for development.

The total number of graduates of the Western University Medical School is five hundred and seventy-eight.

CLINICAL FACILITIES.

Beds Available.

Clinical teaching is carried on mainly in Victoria Hospital, an institution of 400 beds, about 200 of which are available for teaching. Plans for the enlargement of this hospital are being carried out.

Instruction in Psychiatry is given at the Ontario Hospital (for the Insane), where there are from 1,000 to 1,200 patients. Some of this material is occasionally used for instruction in internal medicine.

Work in practical Obstetrics is carried on both in the Lying-in Ward of Victoria Hospital and in the Bethesda (Salvation Army) Hospital. This latter hospital affords 75 beds devoted entirely to obstetrical cases. The members of the Department of Obstetrics and Gynaecology are the attending staff at this hospital.

Material for teaching is available, though seldom used, at St. Joseph's Hospital, the Alexandra Sanatorium, the Victoria Home for Incurables, and the McCormick Home for Aged People.

Work is beginning on a new Children's Hospital of 100 beds, to be under the control of the Board of Trustees of Victoria Hospital. This will provide ample facilities for clinical work in children's diseases. At present, material available in several children's homes is used for instruction in pediatrics.

Autopsies.

Autopsies are available at both Victoria Hospital and the Ontario Hospital. During the past few years there has been a total of only 40 to 50 each year, but an effort to secure more is being made, and with care it is expected that it will be possible to get from 75 to 100 at Victoria Hospital alone.

Remarks.

With the growth of the city the completion of the Children's Hospital and the enlargement of Victoria Hospital, it should be possible to centralize the clinical teaching in the institutions on Ottawa Avenue—the work in Psychiatry remaining, of course, at the Ontario Hospital, and the instruction in Practical Obstetrics being partially carried on at the Bethesda Hospital. This will leave untouched, so far as teaching is concerned, the material available in St. Joseph's Hospital, the Alexandra Sanatorium, the Victoria Home for Incurables, and the McCormick Home for Aged People. The advantage of centralized clinical teaching is obvious; but the material available in institutions not located on Ottawa Avenue could be used if the number of students demanded it.

Victoria Hospital.

Total number of beds	400
Number available for teaching	200

(Most of the clinical teaching is done in this hospital.)

This is a municipal institution. The professors and their assistants in the Faculty of Medicine of the Western University form the staff of this hospital.

Children's Memorial Hospital.

The excavation for this building will be begun within a few weeks. When completed this hospital will be under the same control as Victoria Hospital.

Total number of beds	100
Number available for teaching	50-70

Bethesda Hospital.

Total number of beds	75
----------------------------	----

These are devoted entirely to obstetrical cases.

The Salvation Army built and maintain this hospital. The members of the Department of Obstetrics and Gynaecology in the Faculty of Medicine of the Western University attend all of the ward cases in this hospital, the students attending each case in pairs.

Ontario Hospital.

This is a provincial institution for the insane. There are usually from one thousand to twelve hundred patients in this hospital.

The Superintendent and his Assistant are Associate Professors of Psychiatry in the Faculty of Medicine of the Western University, and the course in Psychiatry for final students is given in this hospital.

St. Joseph's Hospital.

This is a Catholic institution of 153 beds. Occasional use is made of clinical material afforded.

Alexandra Sanatorium.

An institution for tuberculous patients, under the control of the London Health Association. Average number of patients, 250 to 300. Occasional use is made of clinical material here.

Westminster Psychopathic Hospital.

A military institution. At present there are about 325 patients. The total capacity, when completed, will be 480 to 500.

Victoria Home for Incurables.

Supported partially by the City of London. Occasional use made of cases for teaching.

Number of patients	50 to 60
--------------------------	----------

McCormick Home for Aged People.

Supported partially by the City of London. Occasional use made of cases for teaching.

Number of patients 80 to 85

*Orphans' Homes.**Children's Shelter (Children's Aid Society).*

Accommodation 40 to 42 children.

Protestant Orphans' Home.

Accommodation 55 children.

Mount St. Joseph.

Accommodation 135 to 145 children.

Salvation Army Children's Home.

In conjunction with Bethesda Hospital.

EXTENSION WORK.

Child Welfare.

For several years the members of the Department of Pediatrics have been active in the development of clinics for children, etc., in London and in several outlying towns and districts. An active pre-natal clinic has been established for several years in connection with Victoria Hospital.

Extension Lectures.

A number of extension lectures and demonstrations have been given each year by several members of the teaching staff. In some instances these were under the auspices of the University.

With the development this year of an all-University Extension Board, all lectures, demonstrations, etc., given by members of the teaching staff will be in the name of the University.

Nurses' Training Schools.

The Faculty of the Medical School has co-operated for a number of years in the giving of certain courses to nurses in the Training School of Victoria Hospital.

Occasional lectures are given to nurses in St. Joseph's and Bethesda Hospitals.

PLANS FOR DEVELOPMENT.

(a) Completion of new building and installation of equipment necessary for the teaching of classes of forty students. This should be accomplished by October, 1921.

(b) Completion of staff for session of 1921-1922:

Associate Professor of Physiological Chemistry (appointment made).

Associate Professor of Anatomy.

Associate Professor of Pathology.

Instructor in Pathology.

Instructor in Physiology (appointment made).

As the student body increases in size additional instructors in all departments will be necessary.

For the proper development of the Clinical work it seems probable that the appointment of a full-time man in Medicine, with assistance, will be advisable.

(c) Continued effort to aid in development of the *Out-Patient Department* of Victoria Hospital and the utilization of this department for teaching.

(d) Continued co-operation in the matter of the perfection of taking and preserving case records in Victoria Hospital.

(e) Co-operation in development of the *Clinic for Venereal Diseases* at Victoria Hospital under the Provincial Board of Health.

INFORMATION CONCERNING THE FACULTY OF PUBLIC HEALTH INSTITUTE OF PUBLIC HEALTH

INTRODUCTORY.

Establishment of Institute.

The Institute was established in 1912, and has since been maintained by the Provincial Government as (a) an aid to Medical Education; (b) for Laboratory Analyses, Diagnostic and Preventive; (c) for the Development and Teaching of Public Health; (d) for Research on Public Health lines. In fact, it is and has been a "Health Centre" of the more advanced type. With Victoria Hospital (400 beds) on the same grounds, the new Medical School just opposite and the new Children's Hospital to be located just next the Medical School, the Health Centre ideal is nearing completion. We believe this was, when established, the first institution of its kind in North America, as it certainly still is in Canada.

In its teaching capacity it has been established as the *Faculty of Public Health of Western University*—the first such Faculty in Canada.

Relations to Official Work.

In the Institute at present are housed the Provincial Board of Health Branch Laboratory, the District Health Officer of the Provincial Board of Health, the headquarters of the London Board of Health, and the headquarters of the Child Welfare Association.

Recently the Institute has been made a substation as well as a Branch Laboratory of the Provincial Board of Health. Here again the Health-Centre idea—the Province and municipality co-operating with the University—is carried out.

RESEARCH PUBLICATIONS.

Despite the heavy teaching and routine diagnostic and analytic work, the short-handedness of the staff, especially during the war, and the pressure of official duties to the Province, district and municipalities, research has been kept steadily in view and accomplished as follows:

On Contagious Diseases.

1. Census of the Contagious Diseases of 8,786 Children. E. C. Henderson, B.A., Assistant in Vital Statistics. *American Journal of Public Health*, Vol. 6, No. 9.
2. Shorter Isolation Periods in Infectious Diseases. H. W. Hill, M.D., D.P.H. Director, *Minnesota Medicine*. March, 1918.
3. Influenza Amongst the Insane. F. W. Luney, M.D., Chief, Div. of Pathology. Awaiting publication. (Published in part.) *Annual Report of Institute for 1918-19*.

On Diagnostic Methods.

1. Colloidal Gold Test in Cerebro-Spinal Fluids. By G. A. Ramsay, Instructor, and Edward Fidler, Chief, Div. of Pathology. *Can. Medical Journal*, August, 1916.
2. Cutaneous Tuberculin Test by Puncture with Solid Needle. D. A. Craig, M.D., Chief of Tuberculosis Division. A new method. *Journal Medical Association*, October 21, 1916.

On Syphilis Amongst the Insane.

The Blood and Cerebro-Spinal Fluids of the Insane. (A Study by Wassermann, Gold Chloride and other tests.) F. W. Luney, M.D., Chief, Div. of Pathology. Publication pending. *Canadian Public Health Association Journal*.

An Improved Method of Vaccination Against Smallpox.

Adopted in Military District No. 1 amongst the troops, and for civilians. Acupuncture the best method of Vaccination against Smallpox. H. W. Hill, M.D., D.P.H., Director. *Canadian Medical Association Journal*, March, 1916, *British Medical Journal*, February 10, 1917.

On Vital Statistics.

Fallacies of Existing Fatality Rates. H. W. Hill, M.D., D.P.H., Director. *Canadian Medical Association Journal*, March, 1913.

RESEARCH.

1. *Research in the Epidemiology of Tuberculosis.* The most neglected field of Epidemiology in all Public Health, as agreed by Frost, of Hopkins; Freeman, of Ohio, and others who know the Epidemiological situation. (Pearl, of Hopkins, under a grant from the National Tuberculosis Association, has been conducting some statistical researches of great extent, but with small regard to epidemiology.) In 1915 the Director of the Institute published an outline of researches needed in Epidemiology of Tuberculosis, but the war and other difficulties prevented any progress. The personnel and expenses required for one year would approximate \$5,000, and \$3,500 annually thereafter.
2. *Research in Pernicious Anaemia.* Personnel and equipment, \$5,000; and \$3,000 annually thereafter for four years.
3. *Research in Vital Statistics.* A great wealth of material derived from the London Board of Health work, conducted in the Institute; from the Child Welfare Association Clinics; from the Medical and Nursing Inspection of School Children in London, and from other like sources, has been accumulated, but without any assistant in Vital Statistics at present on the staff it is impossible to devote proper time to its investigation and correlation. Such an assistant, previously with the Institute, is again available, and the information now locked up could be made use of if this work were resumed. Salary and expenses, \$2,500 annually.

UNIVERSITY EXTENSION WORK WHICH INSTITUTE SHOULD PARTICULARLY DEVELOP.

University Extension Work to be Done.

1. *Propaganda Work in Public Health.* Moving picture outfit and films, exhibit material, etc. We held, August 27, 1920, a very successful meeting for the Milk Producers' Association, demonstrating, with lantern borrowed from Physics Department, some still slides (very old) and plates, tubes, cultures, milk disc tests—all very modern. A movie film would have attracted a much larger attendance, and, if portable, could be carried out into the farmers' own districts. Personnel, equipment, travelling expenses, and advertising should require about \$5,000 for this year, the definite end sought being the organizing of the people of the counties into county associations for the propagation of public health in their own homes, communities, townships and counties, thus forming a body of the people themselves banded together for this purpose throughout the western part of the Province, under University guidance.
2. *Museum of Permanent Exhibits* for teaching and demonstrating purposes.

GENERAL INFORMATION CONCERNING WESTERN UNIVERSITY

THE AMOUNT OF ENDOWMENT AND THE NATURE OF IT.

There is no general endowment available to the University at the present time.

The late Mr. J. B. Smallman left the sum of \$200,000 to the University, subject to a life interest of his two sisters.

The various sources of Revenue, such as fees (including the amount for each student), Government grants (statutory and special).

The sources of revenue of the University at present are (the figures being for the term 1920-1921):

(a) Students' fees (estimated)	\$26,400 00
(b) Ontario Government grant (special)	79,000 00
Ontario Government grant (from previous year)	5,000 00
(c) City of London grant	55,000 00
	<hr/> \$165,400 00

Explanatory:

(a) Students' fees—

Full Course, Arts, per annum	\$50 00
Medicine, per annum	140 00
Public Health—	
Professional D.P.H.	140 00
Professional Public Health nurses (2 yrs.)...	100 00

(b) There is no statutory grant from the Ontario Government, but a special grant has been made each year towards running expenses. During the war years an additional \$5,000.00 was given. Last year this addition was withheld, but came to us this year, in addition to the \$79,000.00 granted for the present year.

(c) The City of London has made an annual grant to the University each year since the Act of 1908 was passed, the amount being originally \$10,000.00. In the Act there is a proviso that the city must contribute something towards the running expenses of the Institution. The amount of this year's grant, \$55,000.00, is, roughly, a tax of one mill on the city's assessment.

For the five years beginning in the University year of 1913-1914, \$5,000.00 a year was contributed by members of the Board and friends in the city.

THE VALUE OF BUILDINGS.

The work of the University is carried on in rented or donated premises, other than as follows:

The Arts Faculty uses a building on St. James Street, which was purchased at a cost of \$6,500.00, plus \$500.00 for alterations, in the year 1919. There is an encumbrance thereon of \$5,000.00.

The Medical Faculty will, within the next few months, move into a new building now being completed for the University authorities, the cost of which, equipped, including land, will be in the neighbourhood of \$440,000.00 to \$450,000.00. This building is entirely paid for by a grant from the city of London and by private subscriptions.

The Faculty of Public Health is housed in a building erected by the Provincial Government in 1908, at a cost of \$50,000.00. In 1910 the building was equipped at a cost of \$10,000.00, and handed over to the University for operation.

The University was presented, in the year 1914, by a local athletic club with its Gymnasium and equipment. This building, being situated in the rear of residential property, would not be readily saleable, and is of little value other than for the purpose for which it is now used; it will be of no use to the University as soon as buildings are erected on the Kingsmill site.

NUMERICAL SUMMARY OF MEMBERS OF THE UNIVERSITY STAFF.

Faculty of Arts.

Active Staff (not including those absent on leave):

Professors	11	
Associate Professors	5	
Instructors	8	
Lecturers	7	
Curator	1	
Assistant	1	
	<hr/>	
	33	
Student Assistants in laboratories and libraries	8	
Technician	1	
Secretaries	2	
Add	33	
Total	—	44

Faculty of Medicine.

Full-time:

Professors	4	
Demonstrator	1	
Laboratory Assistant	1	
Librarian	1	
Assistant Bursar	1	
Secretaries	2	
	<hr/>	
	10	

Part-time:

Professors	5	
Associate Professors	6	
Assistant Professors	4	
Instructors	15	
Lecturers	4	
	<hr/>	
	34	
	—	44

Faculty of Public Health.

Full-time:

Professors	2	
Assistant Professors	4	
Laboratory Assistants	5	
Secretaries	3	
	<hr/>	
	14	

Part-time:

Instructors	9	
	<hr/>	
	23	
	<hr/>	
	111	

THE NUMBER OF FACULTIES AND THE STUDENTS IN EACH FACULTY.

(a) Three Faculties—Arts, Medicine and Public Health.

(b) Students:

College of Arts	214	
Ursuline College	19	
Assumption College	55	
	<hr/>	
Total Arts	288	
Medicine	138	
Public Health	108	
	<hr/>	
Total in all Faculties	534	

SCALE OF PROFESSORIAL AND ADMINISTRATIVE SALARIES.

<i>Arts Faculty.</i>				
	Maximum.	Minimum	Average.	Median.
Professor	\$3,000	\$2,300	\$2,512	\$2,600
Associate Professor	2,500	2,000	2,250	2,250
Assistant Professor	2,100	1,500	1,843	1,800

Medical Faculty.

Full-time staff:

Professors—\$4,000.

Assistants—\$800 to \$2,000.

Part-time staff:

Lecturers—\$2.00 per hour.

Institute of Public Health.

Professor and Director of Institute—\$6,000.

Professor and Assistant Director—\$3,600.

Professor—\$3,000.

Assistants—\$1,800 to \$2,500.

THE AMOUNT OF ASSISTANCE RECEIVED FROM PROVINCIAL GOVERNMENT
FOR BUILDINGS WITHIN THE LAST FIFTEEN YEARS.

No assistance has been received from the Provincial Government at any time for buildings. The Institute of Public Health, which is now controlled by the University, was not originally built for the University. It was built in 1908, at an expenditure of \$50,000.00, and equipped in 1910 at a further expenditure of \$10,000.00.

THE PROSPECTIVE DEVELOPMENT OF THE UNIVERSITY IN BUILDINGS,
EQUIPMENT, STAFF, STUDENTS, ETC.

The development of the University has been hindered by the lack of buildings and equipment, and the apparent lack of interest on the part of the authorities in Toronto, who have never, since 1908, provided in any year sufficient funds to carry on the work, making it necessary for money to be collected privately to make up deficits and to provide necessary equipment, etc.

The number and the class of students attracted to the Institution in spite of the inadequate facilities provided has always shown that there was a very large field open to the University if it could but be put on a proper basis.

In 1914 a campaign was planned not only for funds, but to arouse the interest of the people of the Western Peninsula, but owing to the outbreak of war it was abandoned. This campaign was being reinaugurated just prior to the appointment of the Royal Commission on University Finance, but since the occurrence of the slump in the financial world the campaign has been postponed until such time as your Commission issues its report.

With modern and adequate accommodation, the number of students will, in the estimation of those who have considered the situation in the western part of the Province very carefully, increase at an enormous rate yearly. Even under the adverse conditions existing at present, both in regard to the utterly unsuitable nature of the buildings used for the work and the fact that they are situated in various parts of the city, the student body in the Arts Faculty has increased at the rate of 66½ per cent. per annum for the past three years.

In the Medical Faculty the number of students each year has had to be controlled, and will continue to be controlled, the number having to be based not only on the facilities and equipment in the medical building itself, but on the clinical material available in the city, and it is not contemplated that the attendance at the Medical School will at any time in the near future be a large one.

In the Arts Department the increase cannot be controlled to the same degree, and is one that must be taken care of.

The University has a site of about 230 acres just outside of the city, where it is proposed to put up the necessary buildings for the Arts Faculty and possibly lease sites to the affiliated Colleges.

Close to the Hospital the University purchased a site, and has nearly completed thereon the erection of a medical building, which will take care of the requirements of that Faculty for possibly the next twenty-five years.

It is proposed to erect on the 230-acre site buildings to house—

1st.—The non-laboratory departments of the Arts Faculty (20 classrooms), offices for Administration, offices for Heads of Departments, Assembly Hall, Faculty Room, Cafeteria, Storage, and so forth.

2nd.—The Natural Sciences, including offices and laboratories of the Departments of Chemistry, Physics, Biology, Geology, and the Museums of these Departments.

3rd.—Library, including office, work room, reading rooms and so on.

4th.—Men students (dormitories).

5th.—Women students (dormitories).

6th.—Gymnasium.

7th.—Central heating station.

In addition, there will have to be a considerable amount expended on the site, to prepare the property to receive the buildings, and in order to erect a bridge across the river which separates the grounds from the city proper.

It is estimated that the cost of this construction, together with that of the Medical School, will reach a minimum of \$2,250,000. With this accommodation the student body will gradually but rapidly grow, and the Teaching Staff will have to be enlarged to keep pace with it. The aim of the University Authorities is not to have a large and unwieldy student body in the University, but rather to provide an unusually high quality of teaching and educational privileges for students who will appreciate the opportunity for obtaining them.

According to the Western University Act of Incorporation of 1908, the Government of Ontario appoints half the Board of Governors and, with the city of London, directs the University's financial policy. The city of London is expected to make annual contributions toward the University's maintenance, while the several municipalities of Western Ontario, in co-operation with the Provincial Government and the city of London, direct its educational policy. While co-operation is implied, the responsibility for the University's development and maintenance would appear to rest with the Provincial Government.

The lines on which aid should be given to the Western University by the Province are:

A—For maintenance for the next five years—

1921-22	\$200,000 00
1922-23	200,000 00
1923-24	240,000 00
1924-25	280,000 00
1925-26	320,000 00

The figure for 1921-23 will be sufficient to take care of a deficit of \$24,349.00 carried forward from the present year. This deficit, which would have been very much greater had the Medical Building been ready for occupation in October last, as anticipated, was caused by the cutting down of the amount of the Government grant from \$135,000.00 estimated requirement to \$79,000.00, plus \$5,000.00.

The amount asked for 1922-23 is the same as for 1921-22, for the reason that, the deficit being paid, an equal amount will give \$24,000.00 to take care of estimated increases.

The amounts for the succeeding three years increase \$40,000.00 annually, the minimum amount estimated to take care of increased attendance, staff and supplies.

B—For buildings

Required immediately.

The Government should contribute the following toward the erection of buildings:

1. Building for Arts Faculty to take care of all non-laboratory subjects (20 class rooms), small auditorium or assembly hall, offices of administration, offices for Department Heads, Faculty Room, storage, etc. . . .	\$600,000 00
2. Building for Arts Faculty to house Natural Sciences, including offices and laboratories of the Departments of Chemistry, Physics, Biology, Geology, and the Museums of these Departments, Storage, etc. . . .	500,000 00
3. Library, including office, work and reading rooms, etc.	200,000 00
Total	\$1,300,000 00

MEMORANDUM SUBMITTED TO THE PROVINCIAL COMMISSION ON UNIVERSITY FINANCES BY
FRED LANDON, M.A., LONDON, ONT., ON BEHALF OF THE ARTS ALUMNI OF
WESTERN UNIVERSITY.

To the primary function of a university, that of teaching students and developing their powers, there have been added in recent years two other functions that have

vastly broadened the scope of university influence and that are apparently entering upon a period of very marked growth and development. These are research and university extension work.

Provision for research, which is the basis of graduate work, is at present sadly lacking in Canada. The federal Parliamentary committee which dealt with this subject last year, presented a report to Parliament that should have stirred to immediate action, but no action was taken. In our own province the need of proper facilities for graduate work has been repeatedly emphasized by President Falconer of the University of Toronto in his annual reports. The lack of such facilities is reflected in the number of candidates for the Ph.D. degree at the provincial university. In 1918 there were 27 students carrying on work for this higher degree, and in 1919 there were 28. Where are the scores of other recent graduates from our Canadian universities who are continuing their studies? The vast majority of them are in American universities. Graduates of Western University are going year by year to Columbia, Chicago, Cornell and other large American universities. The student lists of the graduate schools of these universities show that they are drawing in the same way from Queen's and from the University of Toronto itself. The pity of it is that these graduates, in perhaps a majority of cases, do not return to Canada. The two star men of my own year at Western went, one to Harvard and the other to Chicago. The man who went to Harvard is to-day professor of economic history in the University of Minnesota. The man who went to Chicago is head of the department of English in the Rensselaer Polytechnic Institute at Troy, N.Y. Year by year Canada suffers this drain of her best young minds.

The question might properly be asked, why has not proper provision been made before this at the provincial university, so that students from Canadian universities might not find it necessary to go to another country for their advanced work? The answer to this question would appear to be this, that the provincial university has been faced year after year by a constantly increasing enrolment of undergraduates. Providing for their needs has been so heavy a burden that there was neither time nor money for the post-graduate work. And under present conditions it would appear that this increase in the number of undergraduate students will show no falling off. If 5,000 students are enrolled this year, it is likely that a couple of years hence the number will be 6,000, and future years will see yet greater growth. Meanwhile post-graduate work will be halted just as it is halted to-day.

Various solutions might be offered for this situation, but the most effective way of dealing with the matter would appear to be to utilize the existing university machinery in the province outside of the provincial university, thus lessening the strain on the University of Toronto. There can be no valid objection to reducing to some extent the number of undergraduates in attendance at Toronto. The attendance at the provincial university, stated to be the largest in the Empire, is no doubt a matter of pride, but may constitute a source of weakness if the vast numbers prevent a real relationship existing between teacher and student. Moreover, if the provincial university is in a position to carry on post-graduate work in all main fields of knowledge, the other Canadian universities will year by year send many of their best men and women for work in lines in which they are not themselves in a position to offer advanced study.

University extension work is a second function of universities which is developing rapidly at the present time. In extension work a university must be close to the community it serves and in a position to understand its needs. It must be close to the people. In Ontario we have a geographical area so great that it is inconceivable that any one university could dream of meeting the wide and varied requirements. Old Ontario alone is as large as half a dozen of the northeastern states, it is almost as large as New York and Pennsylvania, and as large as Ohio and Indiana, as large as Virginia and South Carolina. The various states of the American union have found that not one but a number of extension centres are necessary to meet the needs of their people. Ohio has nine universities and colleges engaged in extension work, New York State has twelve, Michigan has three, Illinois five, and Massachusetts has twelve. Overlapping and duplication is avoided in various ways, chiefly by means of extension commissions.

Ontario's great area has, of itself, brought about natural divisions which are to some extent based on economic differences. Western Ontario, agricultural and industrial, thickly populated and centreing around London, is a section of the province which finds its problems different from those of Eastern Ontario. Eastern Ontario likewise finds itself facing problems that differ from those of Central Ontario, and Northern Ontario, of course, is a portion of the province unlike any of the other sections. In the field of extension work no university can serve Eastern Ontario so successfully as Queen's, as none can serve Western Ontario as well as Western. Toronto has ample scope for all its effort in Central Ontario.

Extension work is to-day being carried on, in a limited way, by all three universities in Ontario, each in its own field. The forms of extension work are varied, but include lectures, short courses, extramural work, library service, the summer school, etc. For work of this character there are large classes of the community that are receptive. Among the returned soldiers are hundreds of men who have a new appreciation of the value of education but are too old to start back to school. The shortening of hours of labor in industry has brought an increase in the amount of leisure time that may, by proper direction, be turned into channels decidedly useful to the state. The enactment of prohibition legislation is having a widespread influence upon the use made of leisure time, a fact which has been immediately recognized by the American universities that are carrying on extension work. The foreign-born offer a fruitful field for university service. The extension of the suffrage to women has created a demand for instruction in public issues, in government, in economics, that the universities should meet. Then, among the young people of this province, there are thousands between the ages of fifteen and twenty-five who should be continuing their education, and that many of them are earnestly endeavoring to do so is shown by the attendance in night schools and by the business that is done by the International Correspondence Schools and similar organizations.

The presence of a university in Western Ontario will give a stimulus to every educational activity in this part of the province. It will raise the standard of teachers by enabling them to carry on university work extramurally and in the summer school. The libraries of Western University are to-day at the service of every teacher and every serious student in Western Ontario, with a minimum of restriction. Western University is capable of taking hold of extension work on a large scale, and, being situated in the very centre of Western Ontario, is close to every part of its constituency. The building up of this university in Western Ontario will broaden the viewpoint and deepen the culture of a million people and increase their happiness. It will, at the same time, afford opportunity for an increasing number of young men and women from this district to secure the education that will enable them to take places of leadership and useful service in the future.

APPENDIX VIII

RESEARCH CONDITIONS, PROF. J. C. FIELDS, ROYAL CANADIAN INSTITUTE

Before the War there was no other country in the world where there were so many scientifically trained men as in Germany, no other country in which the Government did so much for science, and gave such recognition to research. Every university was a research institution and every member of the staff a research worker. The same was true of the great engineering schools. There were those two great governmental research institutions, the Reichsanstalt at Charlottenburg and the Prüfungsanstalt at Lichterfelde. As if this were not sufficient there were founded by the Kaiser in 1912 in celebration of the centennial anniversary of the University of Berlin, certain highly specialized institutes, as they were called, with incomparable facilities for research, the manufacturers of Germany contributing to their endowment a sum equivalent to \$6,000,000 as a thankoffering for what science had done for them. In other countries where there is governmental aid for research, it has not heretofore been on the same scale as in Germany, agriculture in the United States alone excepted. There is the National Physical Laboratory in England, and there is the Bureau of Standards in the United States, both supported by public funds. These institutions have done good service to their respective countries, both antecedent to and during the War. The scope of their work has been widened and the expenditures on both have been increased. As a result of the War the interest of the peoples in science has been quickened and governments have felt themselves called on to spend larger sums on research. Early in the War the Honorary Advisory Council for Scientific and Industrial Research was called into being by the British Government, a sum of £1,000,000 being placed at its disposition to aid industrial research. Other smaller sums have since been appropriated to cover current expenses. The British Government, too, is contributing much more largely to the support of the universities. In Japan the Government and the people have put 10,000,000 yen (\$5,000,000) into an institute which is to conduct physical and chemical research. In the United States the National Research Council was created in anticipation of and just antecedent to the entrance of the United States into the War. Though not strictly speaking a governmental institution, it received financial aid from President Wilson during the War. The Carnegie Corporation has presented it with a sum of \$5,000,000, and it is in receipt of \$500,000 from the Rockefeller Foundation for Research Fellowships. A number of donors have contributed \$150,000 for the purchase of a building site, and it has received a number of smaller gifts amounting in the aggregate to a considerable sum.

There are, of course, quite a number of research institutions on private foundations in different countries, which were established long before the War, and which have been doing good work since the beginning. In France there is the Pasteur Institute, with an endowment approximating 50,000,000 francs. In Belgium there are the various Solway research benefactions representing in the aggregate quite a large sum. In England we have the Royal Institution and the Cavendish Laboratory, which, with smaller endowments than those referred to, have conferred incalculable benefits on Great Britain and the Empire.

In the United States more than elsewhere large private donations have been made to research. In the early days astronomical research would appear to have been favored by the larger donors. The Johns Hopkins University may be regarded as an early research foundation, for research was the idea which was uppermost in the minds of those who had to do with the shaping of its initial policy. Research, too, stands first in the minds of those who direct the destinies of the University of Chicago, and Mr. Rockefeller's gifts to that institution, aggregating \$35,000,000, have meant much for research in America. There is also the Rockefeller Institute for Medical Research with its endowment of \$10,000,000, and the Rockefeller Foundation with a capital of \$82,000,000, which has from time to time contributed considerable sums to furthering research in various directions. To this is to be added that portion of Mr. Rockefeller's recent \$100,000,000 gift to Medicine, which will be devoted to research. The Carnegie Institution for Research, with its endowment approximating \$25,000,000, also has forwarded research in many ways, notably through its maintenance of the Mount Wilson Observatory, through its geophysical, magnetic and other laboratories, as also through its magnetic charting of the oceans of the earth and the publishing of important scientific works which could not be brought out on a commercial basis. Furthermore the primary object of the Carnegie Corporation, with a capital of \$135,000,000, is to aid research.

Certain of the larger industrial concerns in the United States spend very large sums on research. Already before the United States entered the War the annual expenditure of the General Electric Company on research in its laboratory at Schenectady had reached the sum of \$500,000. During the War its expenditure on research was at a rate much in excess of this. As an instance of the high level on which some of these industrial laboratories are maintained, and of the liberal policy adopted by the directorate, one might note that in the Schenectady Laboratory are to be found physicists who, as scientists, rank with the first in America, and who in that laboratory find opportunity to cultivate science on the highest plane. It is worthy of remark also that the General Electric Company maintains in Cleveland a purely scientific laboratory for the study of phenomena connected with light, and that properly qualified scientists are freely invited to share with the regular members of the staff the facilities of that laboratory.

The Dupont Companies have spent as much as \$2,000,000 on chemical research in the course of a year. They have introduced the bonus system and a research worker may receive as high as \$50,000 for a successful piece of work. Some two years ago the chemists employed in various capacities in the works numbered 1,100. Of these 290 were research men. The number of the research workers employed in the laboratory of the Western Electric Company at the time referred to was upwards of 300, and the annual expenditure had passed the \$2,500,000 mark.

The companies which spend such large sums on research seem to be well content with the results of their investment. They in general adopt a liberal policy towards their research workers. In many cases they encourage them to attend meetings of scientific bodies and pay their expenses in that connection. The universities might profit by their example. The industries, too, pay larger salaries than the universities to their scientists. In this regard the government departments which employ scientifically trained men are in the same category as the universities.

The industrial research laboratories in the United States have in a way become a menace to the universities and the government departments, which require research workers, through the inducements which they hold out to such workers. The lure of industrial research threatens ultimate disaster to the industries themselves, for if the universities lose their best teachers they will fail to provide the supply of efficiently trained research workers required by the industries. Where the universities and government departments in Canada lose their research workers to the industries, there is often the added aggravation that the industries which benefit are American and not Canadian.

The remedy for the existing state of affairs lies in increased salaries and more congenial surroundings for research workers both in university and governmental positions. With the introduction of such ameliorations no doubt a sufficient supply of scientifically trained men will be forthcoming to meet all the needs of the universities, government departments and industries, both in the United States and in Canada.

Industry, agriculture and other vocations which require the co-operation of research workers must look to the universities for the training of their scientists. The directors of the great industrial research laboratories everywhere emphasize the fact that the men they want are ones who have been trained in the fundamentals of science. For advance in pure science in our English-speaking democracies it would seem that we must look primarily to our universities, and to establishments on private foundations. Before science can be applied, its principles must be discovered. That it pays to make discoveries in science can be illustrated by numerous examples.

As a result of the discovery of the electro-magnet by Faraday in the laboratory of the Royal Institute of Great Britain there are in the world to-day material assets reliably estimated to be worth \$20,000,000,000. The tungsten lamp was developed in the laboratory of the General Electric Company at Schenectady and has in a large part superseded the carbon arc and carbon filament lamps, thereby effecting a saving to the United States in light power which two years ago was estimated to be little short of \$100,000,000 annually.

Experiments conducted in the National Physical Laboratory at Tedington have materially aided shipbuilding, and other research work and the same laboratory has forwarded enormously the art of aviation. University laboratories in Germany and England respectively were responsible for the scientific work which immediately preceded and made possible wireless telegraphy and wireless telephony.

One could cite indefinitely instances of the material benefits conferred by science on the race. Nor would we have to omit Canada in compiling our list. One of the Canadians who might be mentioned, a graduate of the University of Toronto, is a member of the staff of the Government Experimental Farm near Ottawa. His origination of the Marquis Wheat has added tens of millions of dollars to the wealth of his native country. Evidence of his country's gratitude is to be found in the last available report of the Auditor-General of Canada where his salary is listed as \$2,800 a year.

There is room for much more to be done by science for agriculture in Canada. There is no reason why Canada should not, by the aid of scientific methods, double

the value of her deep-sea fisheries as Norway has done already. By research she should be able to realize better on her forest products, to develop fuel resources, to utilize waste products, and to make available a larger supply of those minerals which present themselves in such quantity and variety in our northern country. All this and much more can be accomplished by the aid of properly directed research.

PRODUCTIVE AGENCIES IN CANADA.

1. Government Departments. The Departments of Agriculture, both federal and provincial have done good work.

Good work, too, has been done by the Geological Survey at Ottawa, by the Mines branch and by the Dominion Observatories at Ottawa and Victoria. The scientific men in the departments, however, work under handicap, and receive meagre salaries, so that the Government is often deprived of their services, and they are frequently lured by the offer of higher pay to the Republic to the south of us.

2. The Honorary Advisory Council still lacks a laboratory for research at Ottawa. It has, however, successfully carried out certain investigations, notably those connected with the briquetting of lignite and malnutrition in the black fox industry. It has also instituted a system of research bursaries, studentships and fellowships which have done so much to supply a need in connection with our universities.

3. The Biological Board has done excellent work, e.g., in the preservation and curing of fish. It could, however, do much more if adequate funds were at its disposition.

4. Industrial research in Canada on any considerable scale would seem to be confined to those commercial concerns which are more particularly interested in the production of rubber goods, pulp and paper, acetic acid and acetone and in the smelting of certain ores (copper, zinc and iron). American firms, having Canadian branches, do all their research work in the United States.

5. The Connaught Laboratories have done highly creditable work in the production of antitoxins.

6. In the universities the equipment is sufficient in some departments, in others quite inadequate. All the departments are undermanned. The man who is capable of doing research is usually swamped by elementary teaching. He lacks time for research on his own account. He cannot concentrate on the direction and training of men for research. There is no body of men specially set aside for research, men whose primary functions are to do research and to train students for research. Advanced courses in general and the direction of research in particular are treated too much as incidentals. They are usually contributed by men who are already doing full-time work in undergraduate instruction. In the universities then, as in the scientific branches of government departments, the research man works under a great handicap. What he achieves he achieves despite that handicap. The salaries in the universities are not adequate. On this account the leakage to the United States is very considerable. One of these departments is that of medicine. Both in Toronto and McGill there are organizations which would undertake the investigation of certain problems in medical and surgical research if they were only in the possession of adequate funds to pay competent research men. A typical instance is that of a research man in one of the departments under the Faculty of Medicine in the University of Toronto, who recently exchanged a salary of \$1,500 for one of \$8,000 south of the line. Outside of the universities and the Dominion observatories there are no laboratory organizations in Canada for purely scientific research. There is no foundation in Canada which corresponds to the Royal Institution of Great Britain, to the Carnegie Institution for Research, or to the Rockefeller Institution for Medical Research. For the application of science we have nothing like the National Physical Laboratory in England or the Bureau of Standards and the Mellon Institute in the United States.

There is a lack of Canadian organs for the publication of scientific results. We have the transactions of the Royal Society of Canada, and the transactions of the Royal Canadian Institute. We have, however, no great specialized journals such as are published in the various branches of science in other countries. Much of the research work done by Canadians is published in journals outside Canada. Our libraries do not provide adequate facilities for the research men in science. We have none of those societies in Canada which meet at frequent intervals for the reading and discussing of scientific papers. The Royal Society of London meets weekly for eight months of the year approximately. The Royal Society of Canada holds a three days' meeting once a year. There are also many highly specialized scientific societies in other countries to which we have nothing corresponding in Canada.

SOME DETRIMENTS TO REALIZING ON THE POTENTIAL BRAIN POWER OF THE YOUTH OF THE COUNTRY.

1. (a) There are practically no scholarships in the secondary schools. The remission of fees, while helpful, is not at all adequate.

(b) No special attention is paid to exceptionally gifted pupils.

2. (a) There is a lack of scholarships worthy of the name in the universities. What is called a scholarship in Canada usually consists of a single payment of a sum of \$100 more or less. A scholarship in England will often mean the expenses of a young man for two or three years.

(b) In particular, subsidies for research students are few and meagre. The "Fellowships" for graduate students (usually about \$500 a year) are not only too small, but are utilized for cheap teaching.

3. Under the conditions stated in what precedes comparatively few men complete a graduate course. Of those who do a considerable portion find their way to the United States.

REMEDIES.

To retain the research men we have in our universities it is necessary to increase salaries and reduce the burden of elementary teaching. To increase the number of our research men we must not only modify existing university positions in the sense just indicated, but must add to the number of these positions.

Manufacturers must in increasing numbers realize the aid which can be furnished them by research men and must establish research laboratories.

Positions for research men in government departments must be made more attractive both in point of salaries and in opportunity for research. There is room for much wider development of research activities under Government organization.

We need institutions on private foundations devoted exclusively to research. Men of wealth who would wish to do their country a service and who would be willing to dedicate a portion of their fortune to the good of their fellowmen should learn to realize that no greater returns can be obtained from any investment in the public interest than from an investment made on behalf of research--witness the Royal Institution of Great Britain, the Carnegie Institution for Research, and the Rockefeller Institute for Medical Research, already referred to.

Exceptional ability must be subsidized in the schools and in the universities. No man whom nature has designed to be a research man should have to fall out because he lacks the funds to complete his course. The potential creative thinker is the greatest asset the country has to realize on.

There is no other country peopled by a stock with the brain potentialities of Canadians which possesses undeveloped resources in any way comparable with those of Canada. All that is necessary to realize on these resources is to train a sufficient number of young men of selected ability in the methods of research, and to educate the Government and individuals of initiative in industry and elsewhere to an appreciation of what can be accomplished by science. With a proper policy on the part of the Government and the universities there is no future however rosy to which Canadians may not rightfully and reasonably aspire. The University of Toronto must lead in that movement for reform. Research men on the staff must be relieved of some of the burden of elementary teaching. The teaching staff must be increased. Where necessary strong research men must be added to the staff. All requisite facilities for research must be provided. There must be adequate organization of the research activities of the University. Research functions must be under the control of research men. Monies intended for research should be expended on the advice of research men. It would be desirable to have on the staff a corps of research professors whose primary functions would be to do research and to lead young men of selected ability into research paths.

One would raise the question as to whether it would not be well to have some standard for the professoriate, more particularly in cases where professors are assigned to take charge of graduate and research work? Would it be advisable to introduce from Europe those safeguards for the professoriate which are lacking in America? For example, the English system of electors suggests itself.

Other questions present themselves as to changes which might with advantage be made in the forms of administration or in the constitution of existent administrative bodies.

The Committee of the Council of the Royal Canadian Institute would urge on behalf of the Council that full relief be given to the pressing needs of the University of Toronto, and that generous provision for the future be made in her behalf, and more particularly in all that regards research that the organization be made effective and financial aid supplied in ample measure.

CONDITIONS SURROUNDING UNIVERSITY APPOINTMENTS IN AMERICA.

ADDENDUM TO MEMORANDUM ON RESEARCH CONDITIONS, ETC.

In connection with professorial appointments in America there exists a confusion which results in much detriment to the efficient performance of their higher functions by the universities. There is no ambiguity, it is true, as regards the placing of responsibility of appointments to the professoriate. It rests squarely on the shoulders of the President. Where the confusion exists is in the lack of an understanding in regard to the qualifications which should be possessed by a professor. There is in general no prescription of qualifications explicit or implied either through regulation or tradition. There is no minimum requirement. There is no standard. In the same institution may be found men of High School teaching grade occupying positions of like dignity with those filled by men of international reputation in their special branches. A professor may receive his appointment on the ground of his achievements in research. He may be appointed because of a reputation, better or worse founded, as a teacher.

There are institutions where, on occasion, executive and committee work take precedence of creative and scholarly attainments. In the case of promotions seniority is often the determining factor. A man may be popular with his colleagues; he may be *persona grata* with the president, neither of which facts is detrimental to his chances. Sometimes a man is a good advertiser for his university or college, and this is not unappreciated by those who direct the destinies of the institution.

The irregularities just referred to in connection with appointments are not equally in evidence in all universities on this side of the Atlantic. There are universities in which the atmosphere itself is a corrective. For example, in a number of universities, and notably in the University of Chicago, a research tradition is developing which cannot but have a wholesome influence on appointments. There are universities where a distinction is made between collegiate and university professorships. Where a Graduate Faculty exists the very fact of its existence would seem to imply the possession of special qualifications on the part of those who are members of that Faculty. Such qualifications, however, are not always sufficiently clearly defined.

With regard to professorial appointments in American universities, as at present constituted, there exists a threefold weakness:—

1. There is lack of a clearly defined professorial standard not only as between different universities, but within the individual university.

2. Local influences have too much to do with university appointments.

3. There is no body of men of technical knowledge on whom rests any responsibility for an appointment. It is assumed that the President consults men of technical knowledge. Whether his advisers are or are not scientifically competent, however, they have no public responsibility. They are behind the scene and their professional reputation runs no risk with their fellow scientists in the outside world.

In certain European countries appointments to the university professoriate are safeguarded by devices such as do not exist in America. In Germany before the War the professoriate was triply protected as regards research qualifications. In the first place the prospective candidate for the university teaching career had to make his Doctorate. This implied the writing of a thesis which contained a "Contribution to knowledge." The next step was to qualify as "Privatdocent." Practically the only requirement in this connection, apart from certain formalities, was the production of a piece of research work, which, however, had to be of a much higher order than that which would serve for a Ph.D. thesis.

Qualification as Privatdocent did not make a man a member of a university staff. That was explicitly understood. It simply gave him an opportunity to show the mettle that was in him. He could announce courses of lectures and make use of the university classrooms. He was in competition with the professors for their students. He received the fees of those whom he drew to him. He received no salary however. The professor received both fees and salary.

The Privatdocent was under no obligation to the university. The university was under no obligation to the Privatdocent. If he received a university appointment it was usually in some other university than that in which he had spent his time as Privatdocent. Also the only hope of such appointment lay in the publication of research work of sufficient distinction to attract attention to him. Otherwise he remained a Privatdocent to the end of his days.

The institution of Privatdocent greatly limited the material from which the professoriate could be recruited. It established a standard. It meant a minimum qualification. The actual appointment was made by the head of the State, in Prussia for example by the King of Prussia, from a list of names (usually three in number) placed before him by a committee of the Faculty.

There are occasional exceptions to the method of appointment to the professoriate in German universities sketched in what precedes. Such exceptions, however, are made only in the case of men who have specially distinguished themselves by the publication of some important piece of work of a research character.

In France a pre-requisite to the university career is the Doctorate. Formerly, in addition to being a "docteur" a candidate for a position on the teaching staff of the university had to be an agrégé, that is to say, he had to be a successful candidate in a competitive examination known as the "agrégation." This, however, has fallen into disuse except in the Faculties of Law and Medicine. In science then a young man who has professorial aspirations must in the first place be a Docteur des Sciences. There are two Doctorates in science, a university Doctorate, which will vary with the university, and a State Doctorate. It is the latter which is a pre-requisite to a position on a university staff. The conditions for this Doctorate are on the whole more exacting than those for the German Ph.D.

Before one can become a professor he must serve as "maitre de conférences." At the Sorbonne in Paris it is the tradition to appoint graduates of the Ecole Normale Supérieure to positions on its staff. This, it may be said, is one of those schools for genius maintained by the French Government. It is of university grade, and admission to it is contingent on success in a competitive examination. On the scientific side it is permitted by regulation to accept only 22 new students annually. One hundred and fifty of the most brilliant boys in France, ranging from 18 to 21 years of age, write for entrance. Of these all but 22 must be plucked. The boys in this school live in residence. They enjoy special privileges in their studies, and are not retarded in their progress by the presence of boys of mediocre ability. At the end of three years in residence there is another sifting. The most gifted are headed for the professorial career. The others form a brilliant nucleus for the staffs of the Lycées.

It may be noted that half the students in the Ecole Normale Supérieure are maintained at the expense of the Government. They are under obligation to take service with the Government. The Government is under obligation to furnish them with a position.

When I was in Paris last year I was informed that there were two professors at the Sorbonne who were not graduates of the Ecole Normale. These two, however, were graduates of the Ecole Polytechnique, another school for genius, whose special function is the selection and preliminary training of those men who are to be France's military leaders. Foch, Joffre, Pétain, and others of the French Generals, whose names became familiar to us during the War, are graduates of this school.

It may be added that the actual appointment to a professorship is made by the Minister of Education from a list furnished to him by the Council of the University, and the Council of the Faculty in question. The list must contain at least two names. The French system, like the German, results in the appointment of a strong corps of research professors.

In England the method of making appointments to university chairs is by no means uniform. In certain universities, including Oxford, Cambridge, and London, when a vacancy occurs the general procedure is to name a body of "electors" whose duty it is to select a man to fill the vacant position. The electors are men of technical knowledge of whom a certain number must be outsiders.

The universities, in adopting the system of electors, have had a two-fold object in view. On the one hand they desire to eliminate local pull, and on the other hand to secure the appointment of strong men to positions. The writer was informed that the voice of the outsiders was almost invariably the deciding factor in making a selection. The system is said to work well and to result in the appointment of strong research men to the scientific chairs.

The details as to the precise mode of selecting the electors are not familiar to the writer. They will no doubt vary somewhat with the form of organization of the university in question. There are at least three different types of organization represented among the universities which have introduced the system. In any case one can be sure that cognate departments will have a voice in naming the electors who are to select a man to fill a chair in a given department.

It is to be noted that in the universities here explicitly referred to there are exceptions to the application of the principle of electors. In ancient establishments like Oxford and Cambridge there are chairs which could not be filled by a body of electors save in contravention of the terms of their foundation. The Medical Faculty of the University of London I understand is also to be excepted.

The principle involved in the system of electors might well be introduced into the University of Toronto in a form adapted to local requirements and consistent with whatever organization we may adopt. It is imperative that there should be some change in the organization which at present controls research in the University of Toronto. Is there to be a Graduate Faculty? Are we to have research professors? In any case there will be chairs of sufficient dignity to be filled with men of international

reputation. Why should not the man who is to fill such a chair be chosen by a "Board of Electors," that is to say, by a group of men of technical knowledge who are responsible not only to local opinion, but who also assume a certain professional responsibility in the presence of international scientific public opinion. In the case of certain chairs; too, on occasion, it might be found advisable to include among the electors scientists from beyond our borders.

May I say a word on behalf of the appointment of research professors in our University? A research staff, known as such, would raise the status of the University of Toronto in the eyes of the other Canadian Universities. It would add prestige to the university at home and abroad. It would give the average citizen a new conception of the functions of the university. It would tend to create a public opinion which would be favourable to larger expenditure on higher education.

We have not yet arrived at a stage where it would be advisable to appoint a corps of research professors without any teaching obligations whatever. The burden of teaching, however, should be reduced to a minimum. The functions of a staff of research professors in the University of Toronto would be to do research work themselves and to direct a selected group of students into research paths. They should not be required to do any undergraduate teaching. If they wished, however, to give an undergraduate course in order to keep in touch with the source from which their graduate material would come later on, there ought to be nothing to prevent them doing so.

J. C. FIELDS,

Chairman of Committee of Council of Royal Canadian Institute.

MEMORANDUM IN REGARD TO RESEARCH STAFF.

PRESENTED BY PROF. J. C. FIELDS.

To further the objects of research within and through the University of Toronto, it is deemed advisable that there should be appointed in association with, but not subordinate to, the several departments of Natural Science men whose duties shall consist in the prosecution of research on their own account and in the training of young men of selected ability for research. The appointees shall consist of two classes:—

(a) Research Professors.

(b) Research Associate Professors.

The appointments made in both classes shall be of men who are actively engaged in research. The Research Professor shall be a man who has already distinguished himself in his special science, and who has an acknowledged international standing. The Research Associate Professor shall be a man who has proved himself to be possessed of research ability of a very high order, and who may reasonably be expected to develop into a man of the type appointed to class (a). Men of class (b) should be assured of promotion when they have done the work and acquired the distinction required of men of class (a).

The body of men included under (a) and (b) shall be known as the "Research Staff in the Natural Sciences" of the University of Toronto. Nothing in the foregoing shall be interpreted as meaning that a member of the Research staff may not undertake a limited amount of more elementary teaching if it is his desire to do so, and if arrangements therefor can be made by the department concerned. It has its advantages, too, for a Research Professor to keep in touch with the body of students from which his own research material is to be selected later on.

The salary of a Research Professor should be not less than \$5,000, the salary of a Research Associate Professor not less than \$3,000.

A third class, not of the "Research Staff," but associated with it, should be

(c) Part-time Research Assistants.

Men of decided research bent on the regular teaching staff should have opportunity to follow their inclination. The burden of teaching in their case should be reduced and they should be encouraged to share to a certain extent in the work of the research staff associated with their Department. This would be helpful and stimulating to the men themselves, and would aid in diffusing the research spirit throughout the institution. Occasion would arise from time to time to transfer to the research staff men of the type here referred to. In any case, however, it should be well understood that research achievement on the part of a member of the regular University staff would, in the ordinary course of events, just as surely bring advance in rank and salary as would work in any other field of University activity. Besides the Part-time Research Assistants referred to above there would also be a number of younger men who, after taking their Doctorate, would continue for one or more years to serve on salary as

(d) Whole-time Research Assistants. Such men would as a rule eventually find their vocation as members of the regular teaching staff of this or some other University.

To the research workers just enumerated are to be added the students who will study under them and be guided by them into research paths. A number of student Fellowships should be available. The student Fellow would be expected to devote all his time to his studies. His duties should not include services to the University or members of the Research Staff other than those which are incidental to his training. The annual value of a student Fellowship should be \$750.

The student Fellow and, in general, the man who is encouraged to become a Research Student, should be of such grade as to justify the expectation that after a certain amount of training he would be qualified to be appointed to a position on the teaching staff of a university, or that he would be able to make himself scientifically useful either in a university laboratory or in a laboratory for industrial research.

It should not be forgotten that the teaching professor plays a fundamental role in the development of research in the community. He is intimately associated with the student during his undergraduate course and has opportunity to note his particular abilities and inclinations. He has much to do with formulating his students' ideals. He can point the student of exceptional ability in the direction of research where that would be desirable. He can indicate such student to members of the research staff and enlist their interest in the prospective research men.

Special funds quite apart from the ordinary budget of the departments should be available for the expenses associated with research. These would include:

- (1) Salaries of the Research Staff, of the Research Assistants, and of the Research Fellows.
- (2) Salaries and wages of technical and other assistants.
Under this head would come laboratory technicians, preparators, mechanics, computers, laboratory attendants, stenographers.
- (3) Material and equipment required exclusively for Research.
- (4) Travelling expenses in connection with field and museum workers.

With reference to (3) it is obvious that large sums might be expended on equipment. It is, therefore, important that the equipment already possessed by the University should, wherever possible, be placed at the disposal of the Research staff. Where apparatus or material required by the Research staff is needed, also for undergraduate teaching purposes, some working arrangement would have to be made with regard to its use. This, however, should offer no great difficulty. For the purchase of expensive apparatus to be used exclusively for research it would probably be advisable to set aside a certain sum annually with a view to constituting an emergency fund from which appropriations could be made (on the recommendation of the Research staff) to pay for such purchases.

It should be pointed out that no money, in the first instance at least, would require to be expended in the erection of new buildings, although it might be necessary to make alterations in existing buildings in order to provide accommodation for the Research workers.

APPENDIX IX

STATEMENT OF WORKERS' EDUCATIONAL ASSOCIATION

PRESENTED BY A. J. GLAZEBROOK.

The demand for adult education by those workers, manual and clerical, whose circumstances have excluded from the Universities, is spontaneous and growing. This is the case both in Great Britain and in Canada, and what these men and women ask for is not training in vocational dexterity, but guidance in the pursuit of wisdom.

Like Solomon, the worker desires wisdom and understanding, but, unlike Solomon, he seldom receives the reward of riches and honor, and very rarely expects it. It is to the community that the prize is awarded.

The industrial revolution at the end of the eighteenth century was an unexampled triumph of human intelligence of the mechanical order. It added vastly to the numbers of the white races, and led to a radical rearrangement of the populations. Also it gave birth to a political philosophy of harsh individualism and unrestricted competition which, like a fierce fire, burned away the older bonds that had given at least a semblance of unity to human societies.

The combinations that again emerged out of this individualistic chaos tended to take the form of occupational groups, nurtured upon and living by mutual opposition, and to constitute a new and menacing group self-assertion. Amid this welter of competing egoisms there grew up in the nineteenth century a new tradition of education. From being conceived of as a quiet "drawing out of the powers of thought," an "interpretation of life," education sank to the office of equipping men, not for life, but for conflict.

Fifty years ago, or even thirty, the English world was full of phrases such as "knowledge is power." By knowledge they meant in the main technical knowledge, or knowledge of some business or trade. Unquestionably the speeding up of primary education and of training in occupational efficiency was very much to the good. For a time it ceased to be realized that life did not consist in the business of making a living, and that wisdom, especially political and social wisdom, grew, not from cleverness in business, but from earnestness and breadth of thought.

In spite, however, of the domination of the materialistic view of education, the nineteenth century, from 1825 onward, is full of experiment, usually on a very small scale, in a more spiritual form of education for the workers. Usually these efforts can be traced to some local enthusiasm of the workers or to the genius of some individual teacher. In the later 70's and in the 80's University Extension lectures were established, and it happened that in the earlier days of that movement there were available several men of unusually high qualifications, even of genius. The lectures of Arnold Toynbee, for example, while they were devoted very largely to economic subjects, were full of the spirit of thought. A sporadic series of lectures, however, proved to be ineffective, and gradually the idea of group study developed. In 1903 the Workers' Educational Association began its organization. It had difficulties in obtaining qualified tutors, and it was only in 1907 that the W.E.A. became associated with the Universities of Oxford and Cambridge, and its real development began. The principle upon which this organization has worked from 1907 to the present time is that of serious and continuous study undertaken by relatively small groups of men in association with a highly-qualified tutor. There are at the present time some 250 groups of from 12 to 25 members, who are working on the basis of a three years' course of study, and, in addition to that, there are several hundred one-year groups and a number of other less organized associations for the purpose of study. In the early days of the movement the demand on the part of students was largely for economic subjects, which seemed to have some direct bearing on their class position in society. That, however, is changing, and there is now a large proportion of students in literature, political science, history and various other subjects that have no direct relation to the business either of making a living or carrying on a class conflict. The majority of those students either I believe, middle-aged workers. Young people from sixteen to twenty or thereabouts are always full of restlessness, and in the case even of well-to-do people it is frequently a struggle to induce their young people to continue study during that time. The practical life of money-making has an attraction for them, and they are unable to see the advantages of learning. Working people are rarely able to continue study beyond quite an early age, and for some years after amusements occupy their leisure, and it is only later that the reaction to more serious thought has its turn.

The W.E.A. in Toronto was organized in the autumn of 1918. During the winter before that, one class, conducted by Professor Milner in the study of the "Politics" of Aristotle, and composed of about twenty-five students, had been carried on. This class was successful and enthusiastic, and it was these men who formed the nucleus of the body that took the name of the Workers' Educational Association of Toronto and District. In the season of 1918-19 there were about one hundred students; in the following year about the same number, with somewhat less enthusiasm; but this present season began with a large number (altogether, about 160), and the whole tone was enthusiastic and hopeful. The experience in the Toronto W.E.A. has been similar in many respects to the English organization in the choice of subjects. For the first two seasons economics was mainly asked for, and, of course, there are still a number of people who prefer that, but a comparatively wide demand has arisen for other subjects, and there are now several classes in history, English literature, and psychology. The English literature class includes about forty students. In addition to these classes one has been formed in Hamilton that appears to be successful, and there is likelihood of another. Both in London and Ottawa an effort is being made to form classes, and there are suggestions from other points as well. The classes are not composed exclusively of manual workers, but include a fair proportion of people of what one might describe as the clerical class.

Tutors for these classes are drawn almost entirely from the University staff, and from the first the movement has depended for its life on the support and the assistance of the University, which has been given generously, and, on the part of the tutors, at considerable sacrifice. It has become clear that the main difficulty in the way of wide expansion of the work is money, not that the present tutors are unwilling to continue working at the tiny honorarium that they now receive, but even on this very inadequate basis there is not enough money for much further expansion. Two things are noticeable in the English organization. One is that the main supply of necessary funds comes from public bodies, such as Local Government Boards and the Board of Education; the other is that the Universities who provide tutors are not themselves state institutions, and are limited in the amount of money that they can supply. They do supply the tutors and they have developed a body of men specially trained in the requirements of the W.E.A. The position here is different. Toronto University is itself a state institution, and is dependent for its funds on the Government, so that in the last analysis it must look to the Government for the means for carrying on this work, as it does for the means of carrying on the other departments of University education. The experience of three years has convinced me that there can be one, and only one, satisfactory centre for the distribution of these funds, and that is the University. It is the University, after all, that contains the treasury of knowledge and the training in method that are required. Unquestionably the tutor trained in University is, as a rule, far the best; the amateur is only second best, with a considerable interval.

In point of fact, the whole matter should be regarded as an extension of University work. It is quite feasible that some sides of the organization may be managed in each locality by a proportion of representatives of the workers themselves, but for the arranging of courses of study and the selection of tutors the knowledge and experience of the University is indispensable.

For this important and growing work it is clear that a definite sum of money is required to secure continuous efficiency and expansion. Probably from \$10,000 to \$12,000 would be adequate for the first year, which would include \$2,000 or \$3,000 expenditure which would not have to be repeated, but its place one would hope would be taken by the necessity arising for another all-time tutor.

Suggested Budget for W.E.A. for First Year.

One all-time tutor	\$3,000
Travelling expenses and secretarial work	2,000
Library	2,000
Eight tutors in Toronto at \$400	3,200
	<hr/>
	\$10,200

Accommodation may be found in the University Buildings for the library and reading-room.

Two thousand dollars does not seem excessive for a first instalment of books. Some newspapers and journals, as well as maps, should be provided.

The purpose and meaning of the education provided by this organization would be something quite different from training in technical knowledge or in any of those forms of dexterity that are associated with immediate personal success. This, which one might call the materialistic side of education, is unquestionably necessary, but when

it is given alone its product is not peace, but strife. Individual education in efficiency of one sort and another is, after all, fitting a man, not for life, but for making a living, and making a living is inevitably associated with competition, if not with strife. Further than that, it does little or nothing to fit a man for wisdom in social and political affairs that belong to the well-being and happiness of the whole community.

A community composed of groups or classes mutually hostile, or at least suspicious, cannot be a true society. The root of social harmony lies in like-mindedness, and that, in the social sense, is not to be found in a common pursuit of competitive activities, but in the region of noble thought and purpose. Here great men of every age have lived, and their books and the record of their lives and conversation remain as willing guides for the newcomer.

Of this region it is the business of the University to be welcoming and hospitable host and interpreter. In this circle a true equality can live, and just insofar as it includes all classes it can develop in them all alike the thoughtful mind that will approach the social and political problems that face them from a point of view detached from egoism, individual group, or class.

It is for this that the worker is asking, and he can only receive it in a form that accords with the limits of time and place that necessary occupation prescribes. The W.E.A. is designed to bridge the gap between the Universities which gather their students around them for the sake of convenience and economy and the worker students, who are tied in distant localities and unable to follow learning except during the hours of somewhat scanty leisure.

It cannot be hoped that a majority of any class will seek learning, but it may be brought about that an important minority of all classes may reach a common standard of that detached thoughtfulness that is the basis of political wisdom and the adversary of prejudice and misunderstanding.

APPENDIX X

STATEMENT ON TAXATION, BY W. C. GOOD, PARIS

PARIS, December 25th, 1920.

ROYAL COMMISSION ON UNIVERSITY FINANCE,
Department of Education,
Parliament Buildings, Toronto.

DEAR SIRS,—In conformity with an arrangement verbally entered into on December 8th, I submit herewith some suggestions as to how to increase the public revenue available for educational purposes, and beg to apologize for the delay in sending this communication, which I promised to forward, if I remember rightly, in about a week's time. I trust, however, that the suggestions herein made will not arrive too late to receive your earnest consideration.

I begin by quoting the following sentence from a well-known writer on Economics:

"In every well-developed community large sums are needed for common purposes, and the sums thus needed increase with social growth, not merely in amount, but proportionately, since social progress tends steadily to devolve on the community as a whole functions which in a ruder stage are discharged by individuals."

The education of our young people is one of such functions; and, if the trend of public policy since the time of Ryerson has not been mistaken, we may, I think, infer that the community as a whole *ought* to assume the obligation of providing a public education for all, and, as a corollary, ought to provide equal opportunities for all so far as this may be possible. To make it more nearly practicable increased revenues are necessary, the expenditure of which will generally result in ample compensations. How are these to be got?

My answer is a simple one, which I have had in mind for years. I propose a provincial tax on land values somewhat similar to the special tax levied during the recent war. Municipal assessors now assess "buildings" and "land" separately; and for the purposes of this tax the municipally-assessed values of the land could be taken as the basis. Some objection to this proposal might be raised because various municipalities have various bases of assessment, some assessing at full value, some at half value, and others variously between, and thus some unfairness might result. This same objection, however, held with respect to the above mentioned special war tax, and will hold of all such property taxation so long as methods of assessment are not approximately identical. Perhaps it would not be impossible to secure greater equality in assessing, or, at all events, to equalize assessments for provincial purposes. But at any rate this objection is of minor importance, and is, in my judgment, quite overborne by the very great advantages which will result from the proposal put forward.

The obvious advantages are many. Some may be enumerated as follows:

1. A large and constantly increasing fund would be provided for a purpose which everyone admits is of vital importance to the whole nation.
2. The burden would fall largely upon those most able to pay.
3. Such a tax would help to remove both the temptation and the power to speculate in land and other natural resources and thus materially encourage productive industry. The earnings of labor and the returns on capital would be free from exactions.
4. Incidentally those who now have the best educational opportunities for their children—those living in or near large urban centres—would assist, according to their individual ability, in providing better facilities for those in the more remote districts, where the children are often the brightest and the best, and where, therefore, educational facilities will bring about the best results.

5. Such a tax would return to society, for the best possible purposes, part, at least, of that value which social development has produced, strike a blow at social parasitism, and exalt the worker to his proper position in society.

In making the above suggestions I do not contemplate, of course, that all the increased revenue should be devoted to university education. It is more necessary, in my judgment, to improve rural education and provide secondary education for the masses on the farms. But I am not blind to the great importance of supporting our Universities in a most generous way, and part of the increased revenue would be available for the extension and improvement of University education.

Doubtless many objections will be raised against any new tax for any purpose. This we may expect. The providing of equal educational facilities for all and the more generous support of educational work in general is an object which will, however, commend itself as perhaps nothing else will to the masses of our citizens, and any proposal for such an object would have to be very unfair before it would be finally turned down by the people. It might take time to establish it. A beginning must be made some time, however, and if our educational work is to be better provided for some new source of revenue will have to be secured. I know of nothing which will have as many advantages and as few disadvantages as a provincial tax on land values, and I therefore commend it to your sympathetic consideration.

Yours, etc.,

W. C. GOOD.

APPENDIX XI

STATEMENT OF UNITED FARMERS' REPRESENTATIVE

MR. CHAIRMAN:

I am instructed by the United Farmers of Ontario to make, with your permission, a few representations on their behalf in respect of the enquiries which you are making as to the finance of the Universities.

You are asked to consider demands for payment of deficits of the three Universities of two millions or more for provision of from five to ten millions at once for buildings and equipment, and you are, I understand, to tell the Ministry whence all this money is to come. For the first time in the history of the University the farmers take interest in the finances of University education. In the past, on the recurring occasions of University readjustment, the University was generally supposed, by the farmers at all events, to be subsisting on a sufficient endowment and the interest, if any, evoked in the country on such occasions was mainly that of partisans of the Church organizations which strove for University control or direction. The setting aside of an annual payment of 50% of the succession duties averaged over three years, the gradual assumption of the cost of professional education by the University Commission set up by the Act of 1906, the conversion of the endowment into buildings, and the actual deficits which have been met by higher fees and by executive grants, and the sale of state-guaranteed bonds, have raised among the farmers a natural financial anxiety. It is also realized that the principle of one state University has been abandoned, and that the state is now affording annually to Queen's and London a support greater than the whole cost of University College and the University of Toronto thirty years ago.

The interest aroused in a class which has hitherto been indifferent is not merely of finance. An examination of the records of attendance shows that the rural population, numbering about 900,000, sent last year to Toronto University, but 351 out of a total of 1,833 students entering for study. The records show also that the City of Toronto enjoys the educational benefits of the State University in a proportion far beyond its ratio of population. In the Faculty of Arts, 693 out of 1,797 students came from Toronto, and in all the faculties 1,828 out of 4,777. Wentworth, including the City of Hamilton, with a population of more than 130,000, sent only 77. That is to say, it is apparent that the situation of the State University excludes a large proportion of the people who are outside from its benefits, and the question arises as to what extent a wise public policy will seek to decentralize education and bring it to the doors of those who pay for it.

I am not instructed to claim that the University of Toronto should be the sole recipient of the bounty of the state, but rather I am to urge that the financial and economic necessities of the time require a re-discussion of the University question which may result in greater frugality and perhaps in an extensive decentralization, a decentralization, at all events, of the teaching of culture, that is—of languages, literature, mental and moral science, economics, mathematics and history, with a general survey of science. The cost of laboratories and equipment makes decentralization of the teaching of advanced science and of the science of the professions apparently impossible; but my clients are not without anxiety, seeing the demands which Kingston and London make. To a city, a University becomes an important means of the prosperity of its citizens, and it is therefore reasonably to be feared that having got upon the rates neither Kingston nor London will rest until it has duplicated the faculties, buildings, laboratories, libraries and equipment which enrich Toronto and make it happy. The prospect of these drafts on the public purse is certain to cause unwonted interest among the farmers who have no such commercial interest in University education, and who are now in full view of an enormous depreciation of the values of their products and property while they are staggering under the burdens of the war and of a long period of public extravagance.

Municipal taxation alone approaches, I am told, an annual charge in the townships of \$1.00 an acre. It is not, I am sure, an exaggeration of the sentiments of my clients to say that great as are the claims of the higher life, its means, unfortunately, are dependent upon the lower life of industry. The farmers, it must be admitted, have not made a final judgment about these matters. A final judgment they can only make after long debate of the disclosed facts and with a due regard for all the interests of the community. They require a re-discussion, beginning now and ending after the necessary time, perhaps of years, in a solution satisfactory not merely to Toronto and the educational experts and the cloistered controversialist, but to the whole people. I am, therefore, instructed to say:

1. That the University of Toronto is not well situated, in the business section of a great city and enveloped by a foreign population, to serve as the University of the state. Wisdom would have long since disregarded the sentiment held for the old building and have moved the University to the suburbs or to a quiet country town, where University discipline of students might be exerted.

2. That Toronto enjoys disproportionately the benefits of this public foundation, and ought fairly to contribute materially to the extent of at least \$500,000 a year for the commercial and educational advantages which its citizens receive.

3. That in the past undue support of professional education has been put upon the state, and that in the University of Toronto culture education has been overcome and overborne by professional training at the public expense and immensely for the benefit of the City of Toronto.

4. That in the re-discussion of University Education the position must be taken that the demands of Queen's and Kingston for the foundation of great scientific schools cannot be granted out of the public purse, and that professional science must be taught at one institution if it is to be supported by the public.

5. That with regard to literary studies it is obvious that these are not enjoyed generally by the rural population in view of the figures which have been cited, and it is proper to consider a means of taking literary studies more generally to the people by a modification of the high schools, or it may be by the establishment of local colleges in affiliation with the University not only at Kingston and London, but at other places, and among these places, in the great country north of Georgian Bay, where there is now a population of over 150,000.

6. That the management of the University of Toronto has not been representative of the people, but of the City of Toronto, and that the management of the science schools has similarly been expressive of the City of Toronto.

7. That there has been an obvious disregard to the real interest of the whole people in the devotion of the public moneys to local enterprise and to professional schools, such as medicine, dentistry and the like. A six-year course in medicine is decreed while large parts of the province, where there are old populations and where new settlers are going in to master the land, the people are unserved by doctors or such service as there is beyond the means of those who need it.

8. That feeble and trivial efforts to take culture to the people by means of University extension must give way to better means.

The correction of the evils of a University establishment which was not always wise, and was evidently lately without foresight, is not to be made at once, but evil direction ought not to be further encouraged, and at this time a definite opinion ought to be asserted against the claims made for triplication of the science services. Re-discussion will best be set on foot by returning the University to political control and by laying its annual budget before the Legislature on the responsibility of a Minister. When that has been done, intelligent debate of the University question in the general interest will grow from year to year and the just solution will be found.

LIST OF NAMES OF PERSONS WHO ATTENDED BEFORE THE COMMISSION

The following persons attended one or more meetings of the Commission and presented their views on the questions under consideration:

University of Toronto.

Sir Edmund Walker, Chairman, Board of Governors.
 Sir Robert Falconer, President.
 Brig-Gen. C. H. Mitchell, Dean, Applied Science.
 Dr. A. Primrose, Dean, Faculty of Medicine.
 Dr. C. H. Howe, Dean, Faculty of Forestry.
 Dr. Grant, Professor of Medicine.
 Dr. J. J. R. McLeod, Associate Dean of Medicine.
 Dr. J. P. McMurrich, Professor of Anatomy.
 Rev. Dr. R. P. Bowles, Chancellor, Victoria College.
 Dr. T. C. S. Macklem, Provost, Trinity College.
 Rev. Father A. Carr, Principal, St. Michael's College.
 Prof. J. T. Fields, Professor of Mathematics.
 Prof. W. J. Alexander, Professor of English.
 Mr. Justice Masten, President, Alumni Association.
 Prof. J. C. McLennan, Professor of Physics.
 R. Y. Eaton, Esq.
 Dr. J. Murray Clark.
 Thos. Roden, Esq.
 Miss Scott, Alumnæ Association.
 Miss Evelyn McDonald, Alumnæ Association.
 Mrs. Edith Henderson, Alumnæ Association.

Queen's University, Kingston.

Principal Bruce Taylor.
 Dr. W. E. McNeill, Registrar.
 Professor Austin, Professor of Medicine.
 W. F. Nickle, K.C., Trustee.
 Geo. F. Henderson, K.C., Trustee.
 Francis King, Esq.
 Miss Marty, Alumnæ Association.
 Prof. O. D. Skelton, Professor of Economics.
 Prof. A. C. Clark, Professor of Physics.
 Prof. W. T. Connell, Professor of Bacteriology.

Western University, London.

Major A. T. Little, Chairman, Board of Governors.
 Major T. J. Murphy, Member, Board of Governors.
 W. J. Brown, Esq., Secretary, Board of Governors.
 H. J. Chapman, Esq., Member, Board of Governors.
 Dean W. S. Fox, Faculty of Arts.
 Dr. K. P. Neville, Institute of Public Health.
 Dr. H. W. Hill, Institute of Public Health.
 Dr. P. S. McKibbin, Medical School.
 Dr. C. C. Waller, Huron College.
 Father Muckle, President, Assumption College.
 F. Landon, Esq., Librarian.

Individuals and other Representatives.

W. C. Good, Esq., Paris.
 A. J. Glazebrook, Esq., Workers' Educational Association.
 J. J. Morrison, Esq., United Farmers' Co-operative Society.
 Gordon Waldron, Esq., United Farmers' Co-operative Society.
 Graham Campbell, Esq.

Prof. Milliken, Chicago University.
James Peters, Esq.
Donald Graham, Esq.
Charles MacFie, Esq.
J. W. Schuyler, Esq.
Prof. John Sharpe, Esq.
Herbert Mowat, Esq., M.P.
Mr. Maxwell,)
Mr. Harrison,)
Alderman Cunningham,) United Board of Trade, etc., Western Counties.
Mr. Farrell,)
Mr. Ferguson,)
Mr. Perry,)
Dr. Herbert Bruce.
Dr. H. B. Anderson.
Dr. F. Marlowe.

